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17 May 1984

Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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WORLDWIDE REPORT

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

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BRIEFS

NEW TRANSMITTER AT CARNARVON--A new high-power shortwave transmitter at Carnarvon in Western Australia officially comes on stream tomorrow and will give Radio Australia an additional power for broadcasting voice in its primary reception areas. The minister for communications, Mr Michael Duffy, said the $1.7 million [Australian dollars] transmitter would carry Radio Australia programs deep into Asia and the Indian subcontinent. The 300-kilowatt transmitter is the second high-power facility at the Carnarvon transmitter station. There is also a medium-power transmitter of 100 kilowatt. Mr Duffy said the new transmitter would broadcast 24 hours a day, 7 days a week in several languages. He said the government was steadily improving Radio Australia's broadcasting capability. [Text] [Melbourne Overseas Service in English 1230 GMT 5 May 84 BK]

CSO: 5500/4382

BRIEFS

COMPUTER STATUS--Computer imports into Hongkong grew from 8,600 units in 1980 to 452,000 units last year, according to the Secretary for Trade and Industry, Mr Eric Ho. Speaking at the opening of the Productivity '84 exhibition and seminar organised by Hewlett Packard, Mr Ho said even small businesses can improve their efficiency by applying computers to some of their operations. He noted the Government has launched a number of projects to investigate computer applications in manufacturing. This includes the allocation of funds to the two universities, the Hongkong Polytechnic and the Hongkong Productivity Centre to conduct research into the use of computers in design and production. In addition, a computer course has been introduced into the curriculum of secondary schools, as well as tertiary and vocational institutions. Mr Ho said the computers now being imported into Hongkong are mostly intended for use in homes and offices, adding: "I am anxious to see some of this emphasis move towards the manufacturing sector, which remains the mainstay of our economy." He stressed the necessity of arousing greater awareness among local industrialists of the advantages of computers--not just for payroll, inventory and similar management purposes, but for design, engineering, production and quality assurance. [Text] [Hong Kong SOUTH CHINA MORNING POST in English 3 Apr 84 Business News p 3]

CSO: 5500/7526

MODIFICATIONS PLANNED FOR EARTH SATELLITE ANTENNA

Kuala Lumpur NEW STRAITS TIMES in English 14 Apr 84 p 12

[Text]

KUANTAN, Fri. — A sum of $2 million will be spent on modification work on the 14-year-old main antenna of the earth satellite station in Beserah here, the Minister of Energy, Telecommunications and Posts, Datuk Leo Moggie, said today.

The modification or 'retrofitting' work on the antenna will be completed by July which will make it more effective, he added.

Datuk Moggie, who visited the station today, said apart from the main international antenna there are two other domestic antennae at the station. One is for domestic telephone service and television transmission to Sabah and Sarawak which was commissioned in 1975.

The other antenna was set up in June last year for transmission of television programmes to Sabah and Sarawak when Channel Two went national.

Datuk Moggie who also toured the main international telephone exchange at Tanah Puteh told reporters that the exchange which currently provides direct international trunk-calls to 35 countries will extend the facility to Belgium and United Arab Emirates from April 15.

Company

The Minister disclosed that the $20 million main international exchange which began operations in February this year has a 5,000-line capacity.

"Nation-wide there are about 3,000 subscribers availing of this international direct dialling facility."

He said the exchange has been able to improve the international telephone service.

The Minister said from this month operator assisted international call service will be provided through this exchange.

"A tandem exchange is being set up in Kuala Lumpur and is expected to be completed in July which will further improve the international service."

Datuk Moggie revealed that a total of $7 billion has been allocated under the Fourth Malaysia Plan for the development of the expansion of the country's telecommunications network.

"The amount has to be generated from telecoms services and through Federal Government loans."

He said by the end of 1985 most parts of the country will be covered by the 'automatic telephone using radio' (Atur) service.

On privatisation of the Telecoms Department, Datuk Moggie said a wholly Government owned company will be set up to replace the present Telecoms Department.

The task of running the telecommuniations network will be done by the company.

"However, the company will be answerable to a Government regulatory body which will be set up to supervise its activities," he said.

CSO: 5500/4380

XIZANG CONFERENCE STRESSES BROADCAST DEVELOPMENT

HK171155 Lhasa Xizang Regional Service in Mandarin 1130 GMT 16 Apr 84

[Text] The third regional work conference on radio and television broadcasts, which was recently held in Lhasa, has decided to gradually establish a modern socialist radio and television broadcast network which has the regional characteristics and which lays stress on central and local broadcasts, on radio and television broadcasts, on wireless and wired broadcasts, on urban, rural, and pastoral areas, and on internal and overseas service.

In order to achieve this goal, the conference urged the cadres and workers of the region's radio and television broadcast systems to take immediate action to carry out reform and to struggle arduously. The conference also urged them to start from improving the quality of propaganda and perfecting the means of service, so as to strive to create a new situation in radio and television broadcast work. We must strive to establish an ideology which centers around propaganda work, and fully understand the specific characteristics of the region. We must really do well in the Tibetan radio and television programs. We must start with patriotic education, and gradually heighten people's awareness of communism. We must propagate atheism, and greatly popularize scientific and technological knowledge. We must treat news reform as the breakthrough point, and lead a reform of propaganda work as a whole. We should enthusiastically provide socialist nourishment for the minds of people of all nationalities, and educate and encourage the people and the army to work hard for building a united, prosperous, civilized and new Xizang.

On perfecting the means of service, we should speed up, within 3 to 5 years' time, the expansion and construction of transmission and relay centers, and, in the meantime, consolidate the existing medium-wave relay stations as well as those which are under construction in various localities so that about 50 to 70 percent of the region's population is able to listen to the broadcast. At the same time, we must speed up the pace of constructing video relay stations and relay stations. We must expand the television broadcast coverage as soon as possible to every county.

The conference also studied the issue of strengthening the building of the radio and television broadcast ranks as well as the issue of management.

The regional CPC committee and the regional people's government attached great importance to this conference. Li Wenshan, standing committee member of the regional CPC committee and head of the regional propaganda department, and Jipu Pingcuocideng, vice chairman of the regional people's government, spoke at the conference.

They pointed out: The region is vast and sparsely populated; the transportation is inconvenient; information is relayed relatively slowly; and many people are illiterate. Therefore, it is very important to speed up radio and television broadcast development. The CPC committees and governments in various localities must attach great importance to radio and television broadcast work, strengthen their leadership, and really do well in the work. We hope that the region's radio and television broadcast workers will fully understand and conform to the new situation. We also hope that they will create a new situation in propaganda work by centering around the task of having the peasants and herdsmen get rich, and make contributions for the 20th anniversary of the establishment of the region.

CSO: 5500/4190

CHINA DAILY COMMENTS ON SATELLITE SUCCESS

HK220121 Beijing CHINA DAILY in English 22 Apr 84 p 4

[Article by CHINA DAILY Commentator: "Our Space Triumph"]

[Text] Two weeks ago, China successfully launched an experimental communications satellite into sapce. The satellite achieved an accurate orbit and is functioning properly.

Scientists have run the satellite through experiments in telecommunications and radio and television signals. It is now set to be put into regular service.

This is a major step in improving China's telecommunications abilities. It is also a cornerstone of a solid foundation for China's continuing development of space technology.

Nearly 14 years ago, on 24 April 1970, China sent up its first satellite. Since then, 14 satellites of varying functions have been launched.

Included among them were satellites which were retrieved according to plan, the launch of three satellites from a single rocket and the use of three-stage rocket for launching.

The ability to conduct such advanced research requires technology possessed by only a few countries. How is it then that China, a country which made a late start in the exploration of space, was able to independently research, build and launch these satellites?

Advantages

The key is in the concentration of manpower, funds and materials to surmount all obstacles. Thus, a country like China with comparatively backward scientific and technological bases can move with speed and skill to achieve high levels in some crucial areas of advanced technology.

The socialist system of public ownership has shown its intrinsic advantages in this respect. For instance, more than 100 research institutes and factories all over the country co-ordinated their efforts to build the large-scale space simulator. Several times their combined efforts were called upon to solve particular problems.

It is also the drive to achieve self-reliance that makes scientists, technicians, managers and workers taking part in such projects give their utmost. With a keen desire to see their country's own satellite orbiting the earth they followed developments in space research from around the world and in many cases they enjoyed pleasant co-operation with their foreign colleagues.

Management

China still lags behind some advanced industrialized countries in space technology. Co-operation with other countries is still needed in this field. But we have benefitted and gained experience by proceeding from the Chinese custom of learning what is useful from abroad while taking our own road.

While developing new technology is important for modernization, improved management is also indispensable. To China the latter may be of more importance. Without efficient management based on system engineering, the development and launch of a satellite would be unthinkable.

The lessons learned from China's successes in space technology should be earnestly studied and applied. The technological skills coupled with the managerial abilities which allowed China to enter the space age will be of great use in carrying out the overall modernization program.

CSO: 3500/4195

LEADERS ADDRESS RALLY MARKING SATELLITE LAUNCH

30 April Rally

OW0212225 Beijing XINHUA Domestic Service in Chinese 1617 GMT 30 Apr 84

[Excerpt] Beijing, 30 Apr (XINHUA) -- A rally to celebrate the successful launch of China's experimental communications satellite was held at the Great Hall of the People on the evening of 30 April. The scientists, engineers, technicians, workers, cadres, and PLA commanders and fighters who took part in the satellite project happily got together with over 8,000 people in the capital to celebrate this important achievement in China's socialist modernization drive. Party and government leaders Hu Yaobang, Zhao Ziyang, Wang Zhen, Yang Shangkun, Yang Dezhi, Yu Qiuli, Zhang Tingfa, Wu Qiaomu, Qin Jiwei, Hu Qili, Yan Jici, Ye Fei, Liao Hansheng, Han Xianchu, and Tian Jiyun were present at the rally. The rally was presided over by State Councillor Zhang Aiping, who is concurrently minister of national defense.

State Council Premier Zhao Ziyang spoke at the rally. He extended warm congratulations and regards, on behalf of the party Central Committee and the State Council, to comrades in all departments, provinces, municipalities, autonomous regions, and PLA units, who made important contributions to the satellite project.

Zhao Ziyang said: The successful launch of China's first communications satellite shows the confidence and courage of the Chinese people in scaling the peaks of science and technology. This important achievement in China's socialist modernization drive shows that China has taken its place among the advanced nations of the world in carrier rocket and satellite communications technology. It will produce a far-reaching influence in inspiring the whole party, the whole army, and the people in the whole country to achieve the general goal of the four modernizations.

Praising the new scientific and technical achievements scored in the field of science, technology, and industry for national defense, Zhao Ziyang pointed out: A series of practical experiences has taught us that making concerted efforts to jointly tackle a formidable task is the most effective form of organization for solving a major scientific or technical problem under the specific situation in China. He said: The objective condition for importing advanced foreign technology and management experience has improved. In order to greet the new technological revolution under the new situation,

we should make concerted efforts in a more scientific, rational, and better organized manner to solve key technical problems pertaining to important results in the building of the four modernizations. The series of practical experiences has also taught us that to quicken the pace of socialist modernization, it is necessary to attach great importance to science, value knowledge, and enable the vast numbers of scientific and technical workers to make the best use of their talents and skills. All departments and localities must further eliminate the "leftist" ideological influence and conscientiously implement the policy toward the intellectuals. He urged comrades on the scientific, technical, and industrial front for national defense to guard against arrogance and rashness and to redouble their efforts to continuously contribute to scaling new peaks of science and technology, applying the results of scientific research to the economic construction, and achieving the gigantic goal of the motherland's modernization.

Vice Chairman Yang Shangkun of the Central Military Commission spoke at the rally. He said: The new achievements continuously scored on the scientific, technical, and industrial front for national defense have amply proven that the line, principles, and policies formulated by the party since the convening of the 3d Plenary Session of the 11th CPC Central Committee are correct, and that by resolutely implementing a series of specific policies and principles of the party, comrades on the entire scientific, technical, and industrial front for national defense have found a way to develop science and technology that is suitable to the situation in China. The contingent of scientific and technical personnel on the front is an invaluable force of our party and our army. We must carry out more thoroughly the policy toward the intellectuals and bring into full play their wisdom and talents so that they can display their abilities to the full in building the four modernizations. He urged the commanders and fighters of the whole army to model themselves on the personnel who took part in the satellite project, diligently study science and general knowledge, and raise their capability to use modern arms and equipment so as to more effectively perform the sacred duty of safeguarding and building the four modernizations.

In his speech at the rally, Chairman Chen Bin of the Commission in Charge of Science, Technology, and Industry for National Defense expressed heartfelt gratitude to all departments concerned in the country that vigorously supported and closely cooperated with the satellite project. He said: Each new step of progress achieved on the scientific, technical, and industrial front for national defense has been the result of the implementation of the party's line, principles, and policies, and has been made possible under the correct leadership of the party Central Committee, the State Council, and the Central Military Commission. He pledged to follow the party Central Committee's instructions, bring into full play the capabilities of science, technology, and industry for national defense, speed up the process of modernizing our army's weapons and equipment; strive to develop products for civilian use; and actively take part in national economic construction in order to contribute more to fulfilling the general task and general objective put forth by the 12th CPC National Congress.

Commentary on Launch

HK0109134 Beijing RENMIN RIBAO in Chinese 25 Apr 84 p 3

["Commentary" by reporter Chen Zujia: "A New Leap, A New Starting Point--Commenting on China's Launching of the Experimental Communications Satellite"]

[Text] The experimental communications satellite launched by China on 8 April has successfully gone into fixed orbit in space at a latitude of 180 degrees north, and has begun television transmissions, communications, and radio broadcast experiments. The addition of a Chinese communications satellite to space is an important achievement for our aerospace industry, and marks another new leap in our aerospace technology.

The use of satellites for communication is a new technology that has been developed ir the world since the 1960's. As an important means of quickly obtaining long distance information, communications satellites have already established their eminence in the new technical revolution and become the focus of world attention. Since the successful launch of the first synchronous communications satellite by the United States in 1963, various countries of the world has successfully launched 149 synchronous communications satellites by the end of 1983, of which more than 70 are still in space today. According to the forecasts of foreign experts, nearly 200 communications satellites of various types will be launched by various countries by the year 200?. This shows the important position of communications satellites.

If we were to say that at the beginning of the development of communications satellites most were mainly used for international and intercontinental communications, then in recent years, more and more have been used for domestic communications. For the sake of developing the scientific and cultural education of their own country and strengthening the construction of outlying districts, the Third World countries is particular have one after another either launched or prepared to launch domestic satellites.

At present only a small handful of countries in the world can design and launch a communications satellite by relying on their own technical personnel. China is one of them. China's aerospace industry began with the development and experiment of space rockets in 1958. In 1960, the first Chinese-designed rocket was launched. Since then we have also developed rockets of various types and models. In 1982 we successfully launched a carrier rocket to a predetermined sea area in the Pacific. China's first man-made earth satellite was launched into space in 1970. This achievement marked a leap in our aerospace technology and started a brand new phase of development. In the last 14 years, China has successfully launched 14 earth satellites of various types and models, of which 3 were launched by a single carrier rocket and 5 were recovered without complications. At the same time, in 1977 China began the development of satellite communications earth stations and they have been built in such cities as Beijing and Shanghai. These achievements have prepared conditions in such fields as science and technology, organization and management, and training of qualified people for another new leap in our aerospace technology.

This reporter interviewed some of the aerospace technology specialists who have taken part in the experiment, and they believed that this new leap could be seen from three areas:

In terms of launch vehicles, this launch used a three stage rocket recently developed in China. This kind of rocket has never been used before. This has brought a series of technical problems for the development and production of rockets and satellites. The placing of the experimental communications satellite in a geosynchronous orbit shows that China has the capability to solve these technical problems in the fields of technology, aircraft, and materials. This has opened up vast vistas for the launching of space vehicles in the future.

In terms of the guidance control system, this is different from the satellites launched in the past, for the experimental communications satellite must change orbit many times and readjust its attitude before entering a synchronous orbit. This took a total of 8 days from the launching to moving into position, and was also technically more complicated. In foreign countries, several communications earth stations are generally set up

in various parts of the world, and regardless of which position the satellite is over the earth, they can always measure and adjust its flight attitude and orbit. Even though this is the case, instances of losing track of the satellite still occur. China cannot set up satellite earth stations outside the country. However, though the efforts of the personnel of the guidance control system taking part in this experiment, after our earth stations "could not see" the satellite for a period of time when it traveled to the other side of the earth, we could still promptly track it and accurately send it into a synchronous orbit with the earth. We cannot say that this is not a major breakthrough in space technology.

In terms of satellites, the satellite launched this time is of an experimental nature, and we must still continue to improve and perfect our satellites based on the outcome of this experiment. However, this is an enormous advance compared with the 14 previous satellites. Formerly, the working time of our satellite was not long, and some were recovered after only 3 to 5 days. Synchronous communications satellites must operate for a long period, and in foreign countries they are generally used for from 3 to 7 years.

At the same time, the apogee, or greatest distance from these countries of the satellites launched in the past was about 2,000 kilometers. At present, the experimental communications satellite must operate at a circular orbit of nearly 36,000 kilometers from each. The shocks received by the satellite, and the ultraviolet radiation and the temperature changes its solar battery, infrared horizon sensor, and electronic components are subjected to, have all been stronger than before. The fact that our satellite can still function normally under such conditions and transmit clear images and sounds to earth is also another new leap.

No doubt, judging from certain areas, there is still a certain gap between many of our electronic components, measuring and testing methods, materials, and aircraft compared with the advanced technology of foreign countries. However, on the whole, the level of our carrier rocket technology is by no means inferior to that of other advanced countries and our satellite communications technology has also caught up with the advanced world level. The launching of the communications satellite is a composite undertaking. Just as an aerospace expert has said, the sophistication of sophisticated technology lies in composite efforts. Satellite engineering is an extremely complicated form of systems engineering. China has higher composite capability in science and technology, materials, aircraft, organization, and management. This is the technical reason giving rise to another new leap in our aerospace technology. This point is extremely important to use in meeting the challenges of the new technical revolution. The successful launch of the experimental communications satellite has paved the way for the aerospace industry to serve the four modernizations, and has also revealed to us the magnificent prospects for space exploration in the future.

CSO: 5500/4196

BRIEFS

EXHIBIT OF CHINESE SATELLITES--Shanghai, April 9 (XINHUA)--Two operational mockups of man-made earth satellites will be displayed at an exhibition in Shanghai next month. One is mockup of the country's first satellite, launched on April 24, 1970, which broadcast the music of "Dongfanghong" ("The East Is Red"), and the other is the scientific experiment satellite launched on March 3, 1971. The two satellites are already in Shanghai. The exhibition of more than 1,200 scientific results is sponsored by the Ministry of Astronautics. It will be at the Shanghai Exhibition Hall between May 10 and June 10. Technical exchanges and film shows on astronautics will be held during the exhibition. [Text] [OW091301 Beijing XINHUA in English 1144 GMT 9 Apr 84]

SHANGHAI TELEVISION BROADCAST--Starting on 9 April, Channel 20 of the Shanghai Television Station will broadcast daily, instead of 3 days a week. Thus, viewers in the Shanghai area will be able to watch 2 sets of self-sponsored programs from the station daily. Beginning in the third quarter of this year, Channel 20 will trial-broadcast the morning program of the station daily, and will systematically pave the way for all-day broadcasting. [Excerpt] [OW190151 Shanghai City Service in Mandarin 2300 GMT 6 Apr 84]

GROUND STATION MAKES TESTS--The Nanjing ground station has successfully conducted communications via China's experimental communications satellite. High resolution television pictures and sound were monitored at the ground station. In a test communication with Beijing via the satellite on the evening of 17 April, the Nanjing ground station received clear signals transmitted from Beijing. The ground station's signals, transmitted at 0730 [2330 GMT] on 18 April, were simultaneously received by ground stations in Beijing, Shijiazhuang, Xinjiang, and Kunming. This shows that the satellite transmitter is working normally and that ground stations are operating reliably. With the synchronous communications satellite in place, the problem of poor television reception in remote areas is thus solved. The satellite can also relay clear long-distance telephone calls. [Text] [OW200413 Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 19 Apr 84]

TELECOMMUNICATION AGREEMENTS WITH U.S.--Beijing, 28 April (XINHUA)--The Chinese Ministry of Posts and Telecommunications and the Trade Development Program (TDP) of the United States signed two agreements here this morning. The agreements were signed by Zhu Gaogeng, Chinese vice-minister of posts and telecommunications and Lionel Olmer, U.S. under secretary of commerce. Under the first agreement, TDP is to assist in financing the cost of services for feasibility study on technical transformation of the optical fiber waveguide manufacturing plant in Wuhan and the optical cable manufacturing plant in Houma, Shanxi Province. The second agreement covers a similar project for the multi-carrier system manufacturing plant in Meishan, Sichuan Province. "Sino-U.S. Agreements Signed in Beijing"--XINHUA headline] [Text] [OW280227 Beijing XINHUA in English 0204 GMT 28 Apr 84]

TIBETAN LANGUAGE TELEGRAPH SERVICE--Lhasa, 6 May (XINHUA)--Tibet will start a telegraph service in the Tibetan language on 1 June, according to officials of the regional Posts and Telecommunications Bureau. Either the Tibetan or the Han languages can be used in cable from that date. So far only the Han language has been used. The codes for Tibetan language telegraph were formulated by Lo Goi, director of the Lhorong County Postal and Telegraph Office in east Tibet, on the basis of the Chinese character telegraphic codes. Tibet's Posts and Telecommunications Bureau has trained a number of code clerks. It is expected that the new codes will be used in all parts of Tibet by the end of next year. [Text] [OW061217 Beijing XINHUA in English 0853 GMT 6 May 84]

CSO: 5500/4197

LAUNCHING OF DOMESTIC COMMUNICATIONS SATELLITE ON SCHEDULE

Orbit, Cost Described

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 18 Apr 84 p 12

[Text] The first Brazilian satellite will be launched during the second half of February 1985, from the city of Kourou, in French Guiana, according to a statement made yesterday in Curitiba by the president-director of EMBRATEL [Brazilian Telecommunications Company], Helvecio Gilson, who said that the timetable for the construction of the apparatus is completely up to date. He explained that the satellite will remain at a height of 36,000 kilometers in a geostationary orbit over a plane of the Equator, almost on the border with Colombia, transmitting the signals that will cover the entire national territory from that point.

According to Helvecio Gilson, the expectations regarding costs of the apparatus are also being borne out: "The satellite will cost a total of $210 million, including its placement in orbit, the training of the personnel who will operate it and the installation of the control antenna in the municipality of Guaratiba, in the State of Rio de Janeiro." He also mentioned the efficiency of the satellite and the revolution that it will cause in communications: "The satellite signals will be of the wide band type; in other words, they will be clear to any communications service, including that of television."

Technical Cooperation Set

Rio de Janeiro O GLOBO in Portuguese 18 Apr 84 p 15

[Text] Curitiba--At the beginning of February of next year, Brazil will launch its first communications satellite. The satellite is being assembled in Guatiba, in Rio, at a cost of $210 million (41.8 billion cruzeiros). The launching will take place on a platform in French Guiana, and the satellite will remain in orbit 36,000 kilometers above the line of the Equator, close to the border between Brazil and Colombia.

The president of EMBRATEL, Helvecio Gilson, explained that the satellite will serve all types of telecommunications, from telephone to photographic reproduction, and will operate with a searchlight, reflecting signals:

"It will reduce the costs of telecommunications. We will have more signals than we are receiving from Intelsat, at lower costs, because the stations of our satellite are smaller and less sophisticated."

Yesterday, EMBRATEL and Bamerindus signed a protocol on technical cooperation for the development of telecommunications projects. The purpose of the agreement is to develop a better means of utilizing the systems that have been installed and to discover new services:

"EMBRATEL is interested in increasing the number of users, guaranteeing profitability with a larger volume of traffic in the communications."

The main services offered by EMBRATEL to the large groups are the microprocessor system through telex (equivalent to a PABX for telex); the Trans-Data network which makes it possible to connect computers using the point-to-point system; and the "package" commutative network, which connects users, by means of telephone lines, to data terminals.

2909
CSO: 5500/2039

ITAMARATY SOURCE SAYS COMPUTERS RESERVE MARKET WILL BE MAINTAINED

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 20 Apr 84 p 26

[Text] The reserve market for micro and minicomputers will be maintained, in spite of the campaign being carried out under the management of Senator Roberto Campos (PDS [Social Democratic Party]-Mato Grosso) and with the discreet backing of the negotiators of the foreign debt, Planning Minister Delfim Netto and Finance Minister Ernane Galveas.

The statement comes from a prominent source at Itamaraty, who considers the groups opposed to the reserve market to be "only a minority," and the support from Ministers Delfim and Galveas not to be very significant, "because they do not have any major influence" on the determination of the country's policy on information science.

The United States Government has made every effort to destroy the reserve market, but "to date" the results have been meager, according to an assessment by the diplomatic source. However, it should be expected that, in all the forthcoming economic talks, the Americans will insist upon the opening of the information science market.

One of the reasons for the failure of the group involved in finance and trade between the two countries, set up during President Ronald Reagan's visit to Brazil at the end of 1982, was precisely the differences between the two delegations with respect to the issue of information science. In the end, to avoid embarrassment for both sides, they avoided making the final report.

Opinion

Yesterday, Deputy Pimenta da Veiga (PMDB [Brazilian Democratic Movement Party]-Minas Gerais) arrived at a favorable opinion concerning the bill of Deputy Cristina Tavares (PMDB-Pernambuco), maintaining the reserve market for computer production and import. The deputy argued that there are two options for the country in the information science field: either to establish a policy for a reserve market until the native industry acquires actual strength to compete against the multinationals, though paying the price of not producing the most modern products for several years, or to lift restrictions on imports and the installation of equipment in the country, with the so-called black boxes, wherein the technology as a whole is not transferred.
2909
CSO: 5500/2039

ANNOUNCEMENT NOTES RADIO, TELEVISION IMPROVEMENTS

Dhaka THE BANGLADESH TIMES in English 24 Mar 84 pp 1, 8

[Text] Radio Bangladesh and Bangladesh Television have implemented a number of projects during the past two years to enhance their transmitting capabilities and improve production facilities an official announcement said in Dhaka on Friday night reports BSS.

Among the major projects are Radio's high-power shortwave transmitter complex at Kabirpur near Dhaka costing Tk. 29 crore and the National Broadcasting House at Sher-e-Bangla Nagar with 10 modern studies costing Tk. 26 crore. Other projects under execution by Radio are three 10-kilowatt Medium Wave transmitters at Comilla, Rangamati and Thakurgaon at a cost of Tk. 9.67 crore and a new Broadcasting House at Rangpur costing Tk. 4 crore.

During the past year Radio has taken a number of measures to rationalise use of its resources and enforce economy. Nearly a hundred acres of land on the outskirts of Khulna town costing about Tk. 6 crore has been returned to the Government since Khulna station of Radio Bangladesh now uses a new hundred-kilowatt Medium Wave transmitter at Noapara in Jessore instead of the old 10 kilowatt one at Gallamari.

Another 20 acres of land at Tongi with an estimated value of Tk. 3 crore has been given away by it for building the Islamic University. Other measures of rationalisation will bring about savings worth several crores of Taka.

During the past two years television has set up new transmitters at Cox's Bazar, Rangamati, Noakhali and Satkhira at a cost of Tk. 6.23 crore to expand range of its coverage and added new facilities at the central TV station in Dhaka for 100 per cent colour production. A most modern outdoor broadcasting van has also been added recently. With the help of these facilities BTV has now been producing over 70 per cent of its programmes at home.

BTV has also been able to increase substantially its earnings from advertisement, licence fee and export of programmes. This year BTV is expected to earn over Tk. 6 crore as against its revenue budget of Tk. 5.88 crore.

The number of TV sets in the country is also increasing rapidly, the present figure being over 2.5 lakh including 30,000 colour sets.

The creation of the National Broadcasting Authority with the merger of Radio and TV is expected to bring about substantial savings in administrative cost apart from adding to efficiency in operation.

CSO: 5500/7124

COUNTRY'S SPACE PROGRAM EXAMINED

Islamabad THE MUSLIM in English 9, 10 Apr 84

[Parts 1 and 2 of series by Dr Hasan Askari Rizvi: "India in Space"]

[9 Apr 84 p 5]

[Text] Credit Goes to Soviet Union

"The Government attaches the highest importance to the exploration of outer space and development of space sciences and technology and their applications". (Government of India--1972)

The first space flight by India's Squadron Leader Rakesh Sharma on a Soviet spacecraft underscores the multifaceted Indo-Soviet cooperation dating back to the early fifties. Though the major credit for this achievement goes to the Soviet Union which provided the necessary training to the two Indians, one of whom undertook the space journey on April 3, 1984. The experience gained from this mission and the training in the Soviet Union will be very useful for India's space research programme.

Besides the Soviet Union, India obtained cooperation for its space programme from France, West Germany, the U.S. and the European Space Agency. France and West Germany helped India's rocketry programme. The INSAT-1 was produced in the U.S. and it was launched through American space facilities and the space shuttle. One of India's satellites was put into orbit by the European Space Agency. None of this could match the Soviet contribution. The Soviet Union extended invaluable training to Indian scientists in satellite fabrication, launching, tracking, guidance and control. The Soviets were associated with the fabrication of Aryabhata and Bhaskara I and II. These were launched from the Soviet Union. Their input into India's satellite launch vehicle is no less significant. They also provided training to Indian cosmonauts over the last one year. The close collaboration between India and the Soviet Union for the development of India's space research programme is in line with the present pattern of Indo-Soviet relations marked by cordiality and trust. In fact, indications are that Indo-Soviet cooperation in space technology will be widened in the years to come.

The generous Soviet cooperation has, no doubt, contributed to India's [illegible] strides in the field of space technology. It has created a dependency relationship between the two countries; the further progress of India's space programme will be closely linked with the continuation and extension of Soviet assistance. This is one major consideration why India assigns top priority to its ties with the Soviet Union.

The major objectives of India's space research programme include the initiation, development and mastery of space science and technology. Its roots can be traced back to the late forties when a number of Indian scientists like Homi Bhabha, C. V. Raman, and Vikram Sarabhai undertook a study of cosmic rays at the Indian Institute of Sciences at Banglore. In 1947, Vikram Sarabhai set up a research laboratory for cosmic rays at Ahmedabad. One year later this was expanded into the Paysical Research Laboratory. In the fifties, the Tata Institute of Fundamental Research started balloon experiments to study space phenomena.

The responsibility of exploring outer space for peaceful purposes was assigned to the Department of Atomic Energy in 1961. A year later the Indian National Committee for Space Research (INCOSPAR) was set up by the Department of Atomic Energy to provide greater attention to space research. Dr. Vikram Sarabhai was made its first Chairman. The INCOSPAR established a sounding rocket launching station at Thumba in the state of Kerala. The first rocket (Nike-Apache made by a U.S. firm) carrying a sodium vapour payload was launched from this station on November 21, 1963. This was a modest beginning of India's space research programme which in the next twenty-one years shaped up into the most developed programme of a non-Communist Asian and Third World state.

On the initiative of INCOSPAR, several laboratories and research centres developed in the sixties to conduct research in space science and technology, i.e. propellant engineering, electronics, aerodynamics, control and guidance, satellite communication, structural engineering. The first indigenous rocket was flight-tested in 1967. Since then, Indian-made rockets were fired into space time and again. By November 1983, India had launched 1,556 such rockets. In August 1969, INCOSPAR was reconstituted and assigned the responsibility of actively seeking external technical cooperation for the space programme. Another body, the Indian Space and Research Organisation (ISRO) was created under the overall control of the Department of Atomic Energy. Its major activities included, inter alia, fundamental research in space sciences, the development and fabrication of various types of sounding rockets for meteorological and upper atmospheric studies and satellite launch vehicles. A major change took place in 1972 when the space programme was placed under a separate organisational network. A Space Commission and a Department of Space was established to formulate policy, direct and supervise the space programme, advise the government on these matters and coordinate the work of ISRO, the Space Commission and the Space Department.

The major infra-structure of the space programme includes: (a) Thumba Rocket Launching Station, Trivandrum; (b) Vikram Sarabhai Space Centre,

Trivandrum; (c) Space Allication [sic] Centre, Ahmedabad; (d) Physical Research Laboratory, Ahmedabad; (e) Sriharikota Centre, Sriharikota; (f) ISRO Satellite Centre, Banglore; (g) Auxiliary Propulsion System unit, Banglore; (g) National Remote Sensing Agency, Secundrabad.

Satellite Programme

After the initial experiments in the sixties, ISRO launched five series of satellites during 1975-83. The first Indian satellite--ARYABHATTA--had about 358 kg weight, 1.189 metre height, and a life span of six months. It was launched in April 1975 from the Soviet Union. In fact, Soviet scientists were associated with the development of this satellite from the beginning. Some essential parts and components were also made available free of cost by the Soviet Union. Aryabhatta conducted successful experiments in astronomy, solar physics and aeronomy. It also provided experience to scientists for undertaking and extending similar projects in future.

The second satellite series was named BHASKARA I and II, which were launched in June 1979 and November 1981. Its weight was 444 kg, height 1.189 metre, and the life span was one year. Though most of the payload items was undertaken at Space Application Centre, Ahmedabad, the Soviet input into this project was also invaluable. It was ultimately launched from the Soviet Union in June 1979 with the help of Soviet boosters. It provided data on hydrology, forestry and geology with the help of satellite-born sensors and TV cameras. Data on sea surface temperature, ocean winds and their moisture contents was also obtained. Bhaskara II, launched in November 1981 from a Soviet Cosmodrome, was extension of the research and study initiated by its predecessor.

The third major space venture was the launching of ROHINI RS-I and RS-II satellites in July 1980 and May 1981 respectively. Rohini RS-I's weight was 35 kg, height 549 mm and it had a life span of one hundred days. What distinguished this from the earlier satellites was that it was put into orbit with the help of a locally developed booster rocket--SLV-3. Rohini RS-II (weight 38 kg) was launched ten months later. It showed some problems with the SLV-3 which undermined the mission to a great extent. The experience of Rohini I and II helped scientists to review and improve the SLV programme to make it more effective and capable of carrying a heavier payload. In April 1983, Rohini-D2, a 41.5 kg satellite, was launched from Sriharikota with the help of the improved SLV.

The Ariane Passenger Payload Experiment (APPLE), launched in June 1981, was the fourth satellite project. Weighing about 650 kg it was put in geostationary orbit by the European Space Agency launcher. It provided facilities for telecast relays, radio transmission and telecommunication.

[10 Apr 84 p 5]

[Text] Potential Military Implications

The latest and the most elaborate programme was the adaption of the Indian National Satellite system or INSAT-1 series with technical know-how obtained

from the U.S. INSAT-1A and 1B were built by the Ford Aerospace and Communication Corporation of USA to Indian specifications. The first satellite was launched in April 1982 from the Kennedy Space Centre, Cape Canaveral, USA, on a seven year orbital life.

It soon developed a host of problems. By September 1982, the system was completely depleted and the satellite had to be abandoned. In August 1983, INSAT-1B was launched by the U.S. spacecraft Challenger. With the positioning of INSAT-1B in geostationary orbit, it began to perform four major functions: (a) Provision of more than 8,000 two-way long distance telephone circuits; (b) Reporting round the clock data on weather systems, sea surface and cloud top temperature; (c) Transmission of television programmes directly to the augmented TV receivers in rural areas. Currently TV transmission reaches about 25 percent of the Indian population. With the help of the satellite this percentage will be raised to 75 percent; (d) Improvement of regional and national networking of radio transmission. The improved communication facilities will be especially useful for linking the remote areas, i.e. islands, hill areas, with the mainland. It will also provide communication during natural calamities, i.e. cyclones, floods, when normal channels of communication are generally disrupted. So far, the INSAT-1 programme has cost Rs. 1.23 billion. India has decided to put up INSAT-1C to replace INSAT-1A. It will also be built in the U.S. and launched in 1986.

India plans to launch a Remote Sensing Satellite series, beginning in 1986-87, for geological prospecting. Other future plans include the improvement of design and fabrication of the Satellite Launch Vehicle, building of satellites in India, creation of space stations and the acquisition of expertise to "recover, retrieve, refurbish and relaunch rockets."

There are two on-going programmes of development of space technology. These are the Sounding Rocket programme and the Satellite Launch Vehicle (SLV) programme. In 1964, an agreement was signed with France for the manufacture of Centaur--a two stage rocket--in India. The first three rockets were manufactured at Bhabha Atomic Research Centre, Trombay. In 1971, the Rocket Fabrication Facility at Thumba took over the production of Centaur. The first Indian-made Centaur rocket was launched in 1969. The production of Rohini series rockets (RH-100, RH-125, RH-300, RH-560) was also resumed. These rockets were used for scientific investigation of the upper atmosphere. One application of Rohini-100 was Menaka I and II, used for collection of meteorological data. In 1973, India for the first time launched liquid propellant rocket.

The most complicated rocket was SLV-3 (Satellite Launch Vehicle) designed and built at Vikram Sarabhai Space Centre. It was designed to hurl satellites into orbit. This four stage SLV-3, capable of launching a 40 kg satellite into a near earth orbit, was first tested in wind tunnels in West Germany and India. However, the first attempt for its sub-orbital flight in August 1979, failed. A year later, it was successfully launched. Since then, Indian scientists are working on ASLV (Augmented Satellite Launch Vehicle) and PSLV (the Polar Satellite Launch Vehicle) with capability to lift heavier payloads to higher altitude orbits.

Currently these strides in space research are designed to build an indigenous capability in space technology for the promotion of scientific and technological advancement, stimulation of socio-economic development and improvement of mass communication facilities. India's industry has profited from ISRO's software and hardware orders as well as from the technology developed by the space programme facilities. Radio, TV, Post and Telegraph department, geological and meteorological research have also been its beneficiaries.

Military Implications

These gains should not obscure the fact that the space research programme has potential military implications. Once the programme acquires greater self sufficiency and the sophistication required for its conversion to non-peaceful purposes, India will venture into this area as well. This will be in addition to the employment of space technology for socio-economic development of the country. India's power elite will quietly extend the scope of the programme, describing it as the acquisition of the most advanced technological skills for 'serving humanity' in general and the Third World in particular. Like the facade of the Peaceful Nuclear Explosion (PNE), they will coin the notion of Peaceful Ballistic Missiles (PBM).

The success of the SLV-3 project is of great significance. After necessary modernisation it can be turned into an Intermediate Range Ballistic Missile by installing warheads and control systems. Indian scientists are busy on expeditious completion of ASLV and PSLV so that higher payloads can be carried with greater accuracy and reliability--a prerequisite for any missile programme. This will also require "greater precision in the fields of guidance and control and heat shield protection" for the payload. Scientific work in this field is at a fairly advanced stage. In addition to this, India's defence scientists are working on a wide variety of modern missiles. The production of laser-guided missiles to be made available in the 1990s enjoys a high priority.

When India's Space Programme acquires military teeth it will have serious political ramifications for the South Asian power structure. Given India's military preponderance both in terms of military strength and domestic defence industry, and the achievements in the field of nuclear technology, the keen interest in space technology and the prospects of its ultimate diversion to non-peaceful purposes should not be a matter of surprise. The deep seated aspiration for recognition as a regional power makes it imperative for India to acquire excellence in space related technology and then, use it for peaceful and non-peaceful purposes.

CSO: 5500/4720

SPACE RESEARCH SAID 'READY FOR LIFT-OFF'

New Delhi INDIA TODAY in English 30 Apr 84 pp 82-85

[Article by Raj Chengappa: "Ready for Lift-Off"]

[Text]

PARADOXICALLY enough, while Rakesh Sharma was making his headline-grabbing manoeuvres in Salyut-7, down on the ground, Indian space scientists watched the unfolding drama with exaggerated unconcern. Inside the drab multi-storied headquarters of the Department of Space in Bangalore, a senior scientist turned from the viewing screen and shrugged indifferently. "Well, three cheers to Sharma," he said adding somewhat unkindly, "but our real baby is INSAT."

His preoccupation with India's latest multi-purpose satellite, suspended 33,000 km above Salyut-7, was, however, not all that misplaced. The dazzling space saga last fortnight all but obliterated the sobering fact that Sharma was taking a piggy-back ride on Soviet shoulders. And, though INSAT-1B was bought from Ford Aerospace with a Rs 60 crore price-tag attached, it carries far more relevance in the context of India's own space programme than Sharma's space odyssey.

Way back in 1966, Vikram Sarabhai, the father of Indian space research had flatly stated: "We do not expect to send a man to the moon or put elephants into orbit around the earth." That commitment still holds good. Sarabhai, a brilliant cosmic ray scientist and former head of the Department of Atomic Energy, funnelled India's space programme towards one basic goal—satellite technology. One year before his tragic death in 1971, Sarabhai convinced the Government to approve a 10-year perspective plan for space research geared to achieving self-reliance in satellite technology, a plan that elbows aside any prospect of manned space flights for the time being.

Sarabhai's dreams did not die with him. In 1972, a separate Department of Space (DOS) was born and in just over a decade has earned the country membership in one of the world's most exclusive clubs. Says U.R. Rao, the balding and dynamic head of the Indian Space Research Organisation Satellite Centre (ISAC) in Bangalore: "In just a decade we have been able to develop enough capability to build and launch experimental satellites. By the end of this decade, we will have the ability to launch satellites of INSAT's class. We are buying satellites only to fill the gap so that our own development is not held up."

Development, in fact, has currently put India in the enviable position of being poised for lift-off as far as its space programme is concerned. In 1980, when it successfully blasted the Rohini satellite into orbit from the indigenously-built SLV-3 launch vehicle, it became the seventh country in history to achieve that feat. To date, Indian scientists have designed and built seven experimental satellites, four of which have been launched into space by the Soviets or the European Space Agency (ESA). The Indian Space Research Organisation (ISRO), the operational

arm of the DOS, now has centres dotted all across the country manned by over 9,000 scientific and technical staff feverishly working to give the country that final boost which will rocket it into the space age.

That moment may not be far off. The '80s promise to be the most exciting decade for India's space programme. Next year, ISRO plans to test the Augmented Satellite Launch Vehicle (ASLV) capable of placing a satellite weighing four times more than Rohini into orbit. By 1987, it plans to build the giant 11-storey high Polar Satellite Launch Vehicle (PSLV) which could inject a satellite the weight of an average car into an orbit around the earth's poles at a height of 1,000 km.

In Bangalore, ISAC is putting the finishing touches to its Indian Remote Sensing satellite, (IRS-1), which will weigh 900 kg and is scheduled to be launched by a Soviet rocket in 1986. By the turn of the decade, India will possess the capability to build its own operational satellite of the INSAT class and also have the technology to launch it into space, a capability currently confined to just six other countries. Exults ISRO's Chairman Satish Dhawan: "By the end of the '80s we will see space technology with all its diverse variants truly coming of age in India."

That, clearly is no exaggeration. ISRO's objectives as laid down by Sarabhai, were fourfold. To develop launch vehicles capable of sending satellites into an orbit of 400 km and more above earth; to build satellites capable of remote sensing and communications, develop a mission control segment to track the satellites as they orbited earth and transmit commands which would be obeyed and to build facilities like earth stations to receive the data and harness the satellites' potential.

ISRO has set about achieving these aims with almost robot-like precision. In Thumba, a hamlet on the shores of the Arabian Sea in Kerala, is the sprawling Vikram Sarabhai Space Centre (VSSC), entrusted with the development of rocket launching technology. In 1973, it started work on SLV-3 with a budget of Rs 20 crore and 250 personnel. SLV-3 was an ambitious project; a four-stage 17-tonne rocket the height of a five-storied building, it had 44 major subsystems and over one lakh individual parts to be developed. Few countries are willing to part with rocket launch technology, mainly because of its military implications, and, as VSSC's bearded Director Vasant Gowariker says: "We had to develop everything from scratch and test it ourselves."

SLV-3's maiden flight was a disaster. In August, 1979, the first model launched from Sriharikota in Andhra Pradesh plunged into the Bay of Bengal after rising barely a few kilometres. VSSC scientists discovered that a fuel leak in one of the thrusters which guided the rocket had sent the rocket out of control. But since 34 of the 44 subsystems had worked, the disappointment was somewhat diluted. Within a year, VSSC scientists were back at Sriharikota with an improved model and this time it rose flawlessly into the sky, catapulting Rohini into a low earth orbit. With that success, India became the seventh country after the USSR, US, France, Britain, China and Japan to possess the technology to launch satellites. Says Gowariker: "With SLV-3, our launch capabilities have been firmly established."

Meanwhile, under asbestos-roofed sheds in Bangalore, ISAC is busy upgrading the satellite technology it has already acquired by sending seven indigenously-built experimental satellites into space. India's first satellite, Aryabhatta weighing 358 kg was a quasi-spherical satellite known as a "simple spinner" which was shot into space in 1975 by a Soviet Intercosmos rocket. Five days after launch, however, its power system failed.

Four years later, ISAC sent up the 444 kg Bhaskara I, a far more sophisticated satellite and the precursor to a fully operational remote sensing satellite. It was fitted with special TV cameras and microwave radiometres to survey India's natural resources, a task that would take decades by conventional methods. The cameras were designed to photograph cloud cover and snow cover in the Himalayas to predict weather conditions and water run-off when the snows started melting. The radiometres measure radiation emissions or "spectral signatures" from objects on earth, vital for determining crop patterns and mineral resources among other things. Despite malfunctions in the TV cameras which failed to switch on for a year, Bhaskara I functioned successfully and so did Bhaskara II sent up two years later.

ISAC's next step was communications satellites and when the ESA offered to launch a satellite free if India built it under the Ariane Passenger Payload Experiment (APPLE), ISRO grabbed the opportunity. The APPLE satellite was by far the most sophisticated

Indian scientists have ever produced. Built at a cost of Rs 15.6 crore, APPLE bristled with high-tech equipment like transponders and radiometers capable of handling 900 two-way communication channels, almost half the capacity of INSAT-1B. Despite a jammed solar panel crippling its power supply, APPLE was a major success and gave India the honour of designing and building its own communications satellite.

While ISAC completes its next phase—a communications satellite of INSAT-ability the gap is being filled by INSAT-1B. The achievements of this satellite justify ISRO scientists' indifference to Sharma's achievement. Since last October, INSAT has been transmitting 10 crystal-clear colour pictures a day of cloud cover over India, leading to a dramatic improvement in weather forecasts. Says INSAT-1B Project Director Pramod Kale: "These days when the weather bureau tells you it's going to rain you take out your umbrella."

Over 1,000 long distance telephone and telex circuits are hooked into INSAT ushering in speedier and more reliable communications services. One indication is the fact that all 4,000 telegrams sent between Agartala and Calcutta, a distance of 500 km, are now telegraphed while earlier 3,000 were being sent by post. INSAT is revolutionising rural television education with over 800 villages in Andhra Pradesh and Orissa currently watching a 40-minute programme every evening on community sets. All this, however, is being achieved using just one-third of INSAT's capacity. Once it comes onto full capacity over the next three years, the promised communications revolution will be at India's doorstep.

The sobering factor is, of course, the realisation that India may have come a long way in space technology, but it still has a lot of catching up to do. ISRO admits that SLV-3 has only a "modest" capacity for launching satellites while the Soviets and the Americans perfected their systems almost two decades ago. The Soviet Salyut and the American Voyager and Space Shuttle are state-of-the-art technology far ahead of any of the other space powers. The Soviets currently undertake a space launch every three days. The European Space Agency's launcher Arianne can place satellites like INSAT into space with mathematical precision. But India is not far behind the second-runners. China has launched eight satellites into space, the maximum satellite weight being 200 kg. Japan launched its first satellite in 1970 and is now well on its way to developing more powerful rockets. Japan, however, took more than 20 years to develop its launch vehicle while India achieved that in just over a decade and with a much smaller sized industrial base.

But ISRO will have to accelerate its programme if it is to stay in the space race simply because geo-stationary orbits are rapidly becoming as crowded as Bombay's Marine Drive during rush hour. For any communications satellite, the ideal parking slot is a geo-stationary orbit which matches the earth's 24-hour rotational period and thereby remains, to all purposes, in a fixed point over the earth. The importance of the orbit is that the satellite constantly has a synoptic view of the target area in the same way that INSAT is viewing India.

Right now, to book a slot on that particular orbit, countries have to apply to the International Telecommunication Union, (ITU) a UN body. ITU gives out the slots on a first come, first served basis with the condition that if the satellite is not in place within a specified period, it loses its place in the queue. This, naturally, puts countries like India at a decided disadvantage. Currently, there are 50 satellites parked in geo-stationary orbit and in the next five years that figure will reach 100. ISRO has already asked ITU to urgently revise its policy and make special concessions for developing countries, but so far no decision has been taken. A revision could prove crucial for India's future space plans. Its first indigenously built communications satellite is scheduled to be ready by the turn of the decade by which time the geo-stationary orbit would be full. Any delays in the project could prove a major set-back.

Already, India's space programme, for all its achievements, has been hamstrung by unnecessary and unforeseen delays. The ASLV was originally meant to be fully developed by the middle of next year and the PSLV by 1986. As it stands, both projects are likely to be delayed. Similarly, IRS was scheduled for launch next year but is now only expected to go up in 1986. Space scientists and planners attribute the delays to what they call "shoe-string budgets". They have a valid point. In the past 20 years, India's space research budget has been Rs 543 crore or the equivalent of six Boeing 747s. ISRO's annual budget of Rs 190 crore forms hardly one per cent of the Central budget. This, inevitably,

has led to slower development in space technology and research and, according to ISRO, has on many occasions been responsible for systems failures in the satellites they send up. Lack of funds puts ISRO in the unenviable position of having to work on one project at a time and only when it is complete does it get the go-ahead and the necessary funds for the next one.

One glaring instance of the crippling effect of budgetary constraints is the propellants for the SLV programme. While SLV-3 was being built and perfected, logic dictated that a parallel programme on liquid fuel engines and cyrogenic systems should have been underway. Till 1980, however, it still had no clearance from the Government. Further setbacks came in the form of the Janata government which cold-shouldered the entire space programme and refused to clear major projects. Admits a VSSC scientist in Trivandrum: "We take a calculated risk every time we send something into space when actually in this business we are not supposed to leave anything to chance."

Such restraints have, naturally, also led to inadequate back-up infrastructure without which no space programme can realistically survive on its own steam. Since most of the technology has to be exclusively developed by the DOS, equipment like optical lenses used for remote sensing have to be imported as do the special fibre-inforced plastics for the rocket motor casing. As much as 50 per cent of the electrical components that go into the manufacture of satellites, mainly integrated circuits, are still being imported.

The restraints are inexplicable considering that the areas where DOS has achieved self-reliance has inevitably led to major spin-offs for Indian industry. The solar battery developed for use in its satellites was eventually handed over to the Bharat Electronics Limited (BEL) and Bharat Heavy Electricals Limited (BHEL). In fact, BEL has recently started a space division so that it can meet some of ISRO's requirements.

But despite the crippling handicaps, achievements like SLV-3 really signify the beginning of an era of rocket technology that could transform India into a major space power by the '90s, apart from the military implications it necessarily projects. Though largely a taboo subject, Indian space scientists point out that SLV-3 could, with minor modifications, be easily converted into an intermediate range ballistic missile (IRBM), a fact that Dhawan admitted when the rocket first went up.

Similarly, satellites like IRS can spy with relative impunity on troop formations or movements and arsenal build-ups by neighbouring countries. Soviet and American spy satellites can take such detailed pictures that even a car number plate on the ground is clearly visible. That India is keen on using its rocket technology for defence purposes is obvious from the fact that Abdul Kalam, project director for SLV-3, has been sent on deputation to the Defence Research and Development Laboratory in Hyderabad where production of a surface-to-air missile is underway at the moment.

But even if Dhawan's insistence that India's space programme is "walking on peaceful legs", it is a walk that certainly involves long strides. Once India scales up SLV-3 and makes it capable of launching heavier satellites into higher orbit, it will signify a major turning point in Indian space research. ISRO is currently engaged in developing the kind of rocket motors and fuel which will make this possible. Essentially the requirement is a more powerful propellant, both liquid and cyrogenic. SLV-3 used solid propellants made from ammonium perchlorate and aluminium powder mixed into a chemical resin. Though India has achieved state-of-the-art status in solid fuels, liquid propellants have a greater advantage. Propellants made of liquid oxygen and kerosene or the more powerful cyrogenic propellants made from supercooled liquid oxygen and hydrogen have a higher burning efficiency than solid propellants, leading to greater thrust.

Using French technology, India has already built a liquid fuel engine called Vikas and is presently setting up a unit to test the engines in the Mahendragiri hills of Tamil Nadu. ISRO is also working on designs for a cyrogenic engine which uses fuels with temperatures as low as minus 350 degrees C°. Once these projects are completed, India's space programme should shift into top gear, an analogy that Professor M.G.K. Menon, Planning Commission member, also likes to employ. "It's just like driving a car," he explains, "you don't go into top speed immediately without changing gears. We are in first gear now and in the next few years, we should be able to attain full speed."

In that context, Sharma's dramatic moments in space may not be that insignificant in relation to India's space programme. For the first time, space has become an avidly discussed subject and the millions who tracked the event on television now have some idea of the significance of space and its myriad applications on earth. The fact that Mrs Gandhi has kept charge of DOS is an encouraging sign that its priority might get a further boost after Sharma's splashdown last week. Right now, all that India's space programme needs is just that extra push to take it from development stage into the operational one. Which is a giant step. If Sharma's odyssey can help in some measure to achieve that, it will be well worth the effort.

CSO: 5500/4721

BRIEFS

REMOTE SENSING SATELLITE PLANNED--The Indian remote sensing satellite is to be launched from the Soviet Union in 2 years. An agreement on this was signed between the Indian Space Research Organization and the concerned Soviet organizations. The satellite will weigh about 950 kg and will be in orbit at an altitude of 900 km. [Text] [BK021329 Delhi Domestic Service in English 0830 GMT 2 May 84]

CSO: 5500/4721

WORK ON COMMUNICATIONS SATELLITE SAID BEGUN

Rawalpindi HAIDAR in Urdu 21 Apr 84 p 4

[By staff reporter]

[Text] Karachi, 20 April (APP) — The work on designing a Pakistani telecommunications satellite has begun, and the Suparco [Space and Upper Atmospheric Research Commission] scientists and technical experts will complete the work by November this year.

According to official sources, Suparco is preparing the design in collaboration with a foreign space research firm, and Pakistani experts are participating in every aspect of this project. When the detailed survey is completed in November, then Suparco will examine every aspect and possibility of steps to be taken before signing an agreement with a foreign firm for the production of a satellite and for which work will begin next year. It will be launched by the end of the current decade. With this satellite, two-way telex and telephone circuits will become available and it will be used for radio transmission and computer links. In addition, two television channels will also be set up.

Under the plan, two satellites will be produced but only one will be used. The other one will be stored for an emergency. The whole project is estimated to cost $35 million. Under the plan, training stations will be set up to send and receive messages which will include training control stations, 5 trunk stations and 100 smaller receiving stations, some of which will be mobile. The scientists and technical experts of Suparco will receive the necessary training, and organizations that will benefit from it, such as the Telegraph and Telephones Department, the Education Ministry, and the radio television organizations, will be included in the project.

CSO: 5500/4725

ROLE OF INFORMATION MEDIA DISCUSSED

Manama SADA AL-USBU' in Arabic No 648, 21 Feb 84 pp 27-30

[Article: "When Information Is Active"]

[Excerpt] The extent to which information in any society is strong, effective, and active will determine both the interaction of the individuals in society and the magnitude of the positive achievements that are realized.

On the basis of this concept, we find it appropriate to deal with information in Qatar somewhat appraising. This handling of the matter actually has more than one cause, for Qatar is now experiencing celebrations on the occasion of its national day.

Private statements concerning the effectiveness of Arab information say the following:

The efforts of the Qatari Information Ministry are continuing to move quickly toward mobilization and utilization of the media in order to offer quality service to the listeners and viewers everywhere. This is based on the importance of information's mission in building the human being and elevating him intellectually, socially, and politically. The media must provide the listeners and viewers with a true and objective message far removed from provocation and exaggeration.

On the local scene, Qatari information plays a prominent role in serving the issues of the people of the Gulf, deepening the foundations of unity, and laying them firmly between the people of the Gulf Cooperation Council [GCC] countries. On the Arab level, the information system in Qatar champions and stands by Arab causes, especially the cause of Palestine.

Perhaps the impetus behind this comes from the fact that the government of Qatar has adopted the course of information and given the media complete support. This has had a positive effect on the information system's various programs, which have been well received and successful on both the local and external levels. Therefore, it might be appropriate for us to become acquainted with some of what has been achieved in a number of informational fields in Qatar. In this way, we may be able to learn just how much successful media can accomplish.

Qatar's radio broadcoast system plays an effective role in society. In view of the importance of radio's mission in the service of people in general, the state has devoted its attention to the broadcast service and worked to develop its various programs in the following areas:

Broadcast Service

The radio programs and various subjects sent out by the broadcast system now account for 40 hours a day in English, Arabic, and Urdu. The broadcasts cover the Arab Nation, Asia and Europe.

Qatari radio has four programs: the general Arab program, which broadcasts 19 hours a day, the English program, which broadcasts 18.5 hours a day, the popular program, which broadcasts 3 hours a day, and a program in Urdu.

Currently, Qatar has 14 completely outfitted broadcast studios, in addition to an automated studio for sending western music. The new broadcast building contains eight studios, including a completely outfitted studio for dramatic works and the recording of songs that can accommodate an entire orchestra.

Transmission Stations

The number of radio transmission stations has reached 12. Qatari radio is distinguished from other radio systems by its news service and political reports, which are characterized by objectivity and comprehensiveness. In order to achieve this, the system has place correspondents in most Arab and foreign capitals. Among the recently achieved projects was the provision of two completely outfitted vehicles for external transmission. Moreover, the necessary studies have been done to renew the second broadcast building and the al-'Arish transmission station. In addition, two medium wave transmitters with a power of 100 kilowatts at 675 kilohertz have been set up to serve the public program.

In terms of future projects, the radio system is doing the studies needed for the establishment of a short wave transmitter in the al-Jamil region in the north. Such a transmitter will be able to send the voice of Qatar to most regions of the earth. It is expected that a French-language program will be transmitted soon.

Television Achieves Uninterrupted Progress

The current transmission capacity of Qatari television is 16 hours a day, or 112 hours a week on channels 9, 11, and 37. Channels 9 and 11 are used to broadcast 11 hours of programming a day, or about 75 hours a week. Local programming accounts for 45 percent of total transmission time, while imported Arab programming and series account for 26 percent. As for foreign programs, they account for 24 percent.

As for the transmission hours on channel 37, they amount to 5 hours a day or 35 hours a week, during which educational television programs are broadcast.

Qatari television has recently been offering dramatic and historical series that have been well received both at home and abroad. The television system has worked to involve the Qatari actors in the series, in order to make use of their experience and abilities.

Recently, the cinematic system was used in program production by means of the two-track sound and picture system for the first time. In addition, two vehicles for live-coverage television transmission were purchased. One is equipped with four modern cameras, and the other with three. Moreover, the live-coverage unit already owned by the television system was outfitted with three cameras of good type. Moreover, a telecinema device was installed, while eight mobile cameras and a special video unit were purchased, in addition to 15 special lighting units for the mobile cameras. Six dramatic works were filmed, in addition to a number of programs and various broadcast pieces. Furthermore, support was given to the news service. An agreement was concluded with the French News Agency to provide the television system with a daily news broadcast via satellite.

With respect to future projects, work is proceeding on the installation of booster stations for the currently operating transmission stations. In addition, there is a project to set up a cinema building, which is to be outfitted with the necessary devices and equipment. This project will make it possible to produce cinematic films in the future and provide the possibility of cinematic production without recourse to foreign production. There is a project to construct an addition to the current building. This addition would supply all television production of various types. In addition, various programs are being completed. Examples are the production of a series about the Prince of the Poets, the recording of a program about the story of oil in Qatar, the execution and filming of a musical about diving, a film about the start of soccer in Qatar, and other projects.

Printed Material and Publication

The Administration of Printed Materials and Publishing is undertaking several activities, both locally and abroad. On the local level, the administration seeks to make known the achievements of the state and the comprehensive renaissance it has led. It does this via the printed word and expressive images. It applies the laws and organizational rules for printed materials and publication in a manner that balances off the preservation of freedom of opinion in published works against the state's right to care for the values and traditions of society.

The administration applies Law Number 8 of 1979 on printed materials and publication, which is considered a strong support of freedom of the press in the country.

In the foreign area, the administration makes known the Qatari renaissance and invites journalists and men of the press to visit the country and see for themselves the cultural renaissance it is witnessing.

The administration has published numerous books, pictures, and maps in Arabic, English and French. As part of its new plan, it will introduce the computer. It is also planning to publish some specialized books, with one of the most prominent ones being a book on the origins and development of Qatari journalism.

Qatari Journalism

The law on printed materials and publication has mandated freedom of the press in the country. On this basis, journalism in Qatar interacts with the issues of society and works to bring them out, with the goal of finding solutions to the problems that plague life. The state has worked to support the Qatari press with backing and encouragement. Perhaps the biggest thing the state has done for the press is that it does not practice any censorship of it.

The newspapers in Qatar are published within two sectors. The private sector publishes certain papers, while others are issued by the public sector. There are a total of 18 newspapers and magazines in Qatar, including daily, weekly, monthly, and periodic publications.

These are the daily newspapers: AL-'ARAB, AL-RAYAH, and the newspaper GULF TIMES, which appears in English.

These are the weekly magazines and newspapers: AL-URUBAH, AL-'AHD, AL-SAQR, ASWAQ AL-KHALIJ AL-IQTISADIYAH, and AL-DAWRI AL-RIYADIYAH.

These are the monthly and periodic magazines: AL-DAWHAH magazine, which is published by the Ministry of Information, DIYARUNA WA AL-'ALAM, which is published by the Ministry of Finance, AL-MASH'AL, which is published by the Ministry of Petroleum, AL-UMMAH, which is published by the Directorate of Religious Law Courts and Religious Affairs, and AL-TARBIYAH, which is published periodically by the Qatari Commission on Education, Culture, and the Sciences.

In addition, there is a monthly women's magazine called AL-JAWHARAH. There is also the magazine of the Qatar Chamber of Commerce. Then there is AL-RAYYAN, which is published by the National Museum of Qatar. In addition, there is the magazine on local affairs published by the Ministry of Municipal Affairs.

Moreover, some newspapers and magazines appearing in Qatar are published by local organizations and institutions. The University of Qatar published SAWT AL-JAMI'AH and AL-JAMI'IYAH. HAMD is published by the HAMD public hospital. The Qatari Red Crescent Association publishes AL-"ITA', while the Ministry of Public Health publishes MAJALLAT QATAR AL-TIBBIYAH.

The Qatari News Agency

The Qatari News Agency was set up in 1975, and in its short life, it has achieved noticeable success at home and abroad through truthful news and neutral, objective opinion. Its news reports have come to be trusted on all levels.

The news agency produces a daily report in English and issues documentary books that record the most important events in the states of the Gulf Cooperation Council and the Middle East region.

The agency is currently working on broadcasting its English report over its network and distributing it to five countries. Moreover, construction of the internal network for the transmission of pictures to local newspapers has been completed. The agency's publication has been distributed in the countries of Central America and Latin America in Spanish and Portuguese, and the agency's service has been linked to the Yugoslavia news agency, through which it is distributed to the non-aliged countries.

The agency's service in the future will be characterized by comprehensiveness and ambitiousness. One of its most prominent projects is a special building for the news agency and the completion of its network so that it can include parts of Europe, Latin America, Japan, and Australia. Internal and foreign broadcasting are to be supported with new technical equipment and the introduction of electronic systems for the monitoring division. In addition, a center for organizing news reports will be constructed and the video screen project, with editing in Arabic and English, will be implemented. There is a microfilm project for the division of documents and studies. Agency correspondents in some Arab and foreign countries are to be appointed. The young people of Qatar who occupy leadership positions in the agency will be sent on training tours with the world agencies , and some employees will be sent to courses of English language instruction.

12224
CSO: 5500/4510

NEW TRANSMITTER TO SERVE NATIONAL GOALS

N'Djamena INFO TCHAD in French 29 Mar 84 pp 1, 2

[Article by Chadian Press Agency: "A Great Accomplishment"]

[Text] "I expect everything of the radio station," said a listener who was asked in a poll what he expected of Radiobroadcasting. Although exaggerated, his answer takes on symbolic value when it comes to defining the role of this means of communication for the masses. This example is enough to indicate the full importance of the simple inaugural ceremony of Chadian National Broadcasting's new short-wave transmitter last Tuesday in Gredia. Activating the powerful equipment is, of course, a great accomplishment but it represents above all a political aspiration.

The wager that the Ministry of Information has carried out is broad in scope. For 4 years, the CNB covered only a miniscule portion of the country. Several thousands of our fellow citizens were cut off from that important decision-making center, the capital, and were sometimes unaware of events taking place a few kilometers away. As understandable as it may have been, this situation could not go on. Thus, the efforts undertaken by the national authorities have fulfilled a wish nurtured by all Chadians. By virtue of this, the re-inauguration of the transmitter will figure in the list of the Third Republic's great accomplishments. Nonetheless, the accomplishment is less important than the political aspiration behind it. A means of mobilizing the masses, radiobroadcasting plays one of the most important roles in the life of a people, through the messages it conveys and the exchanges it makes possible. In Chad, more than anywhere else, it has become a necessity because of the three-fold isolation that we endure and the uncommon state of war. Every Chadian, however distant from the capital, must be informed about the reality of his country. From this perspective, the installation of a transmitter as powerful ad CNB's is a very natural reflection of the will to involve Chadians in the life of their country. Aware of the need to explain the goals it is pursuing, the difficulties it encounters and the solutions it proposes, the Government can in no event do without this invaluable means of dialogue. In addition, Radiobroadcasting today is the foundation of reconciliation. With the information that it gives out, it greatly facilitates mutual understanding between individuals residing in the "same geographic area," who share the same aspirations to liberty and well-being. It is also a spring for the

association of ideas, the awakening of a faculty of judgement beyond intellectual creativity.

Indeed, the installation of the new transmitter, by virtue of its power, has become a means of action toward the Government's primary objective: national unity. Thus, this accomplishment is no longer seen as an isolated event, but an effective contribution to the Chadian nation's goal of rebirth.

But, however powerful a radio might be, it cannot carry out its role unless it is used wisely.

This listener is demanding and quite rightly expects the radio, his everyday companion, to answer his desire for information and recreation. CNB has an important battle ahead of it: Now that is has full power, it must recapture its listeners so that Chadians will lose that regrettable habit of tuning into to other stations, and regain the following our radio had begun to build abroad.

12423
CSO: 5500/63

FAST-SPREADING TELETEX TO NUDGE OUT TELEX IN SOUTH AFRICA

Johannesburg THE STAR in English 10 Apr 84 p 14M

[Text]

Hundreds of South African firms have entered the field of high-technology teletex — which can send text of typed letter quality at high speed on the world-wide telex network.

It is eventually expected to replace the outmoded telex system.

A teletex machine can transmit a standard business letter of some 300 words (or 2 000 characters) to another teletex terminal in under nine seconds — 48 times as fast as telex to telex.

But the printer at the other end will "slow down" delivery to about 40 seconds as it raps out the message.

The result is a clean-typed A4 page, with small letters as well as capitals — and all the punctuation inserted.

Teletex, says the Post Office, will in time revolutionise business communications — and shoulder more of the letter burden now carried by the postal services.

For instance, it has been estimated that almost a quarter of letters now delivered by conventional means in West Germany could be transmitted by teletex.

Teletex has been relatively easy to introduce because South Africa was one of the first countries to install the advanced electronic exchanges needed to make telex and teletex interchangeable.

These exchanges — which in effect are specialised computers — can convert the 2 400 bits-a-second of teletex to the mere 50-bit/sec of telex.

So one teletex terminal can not only "talk" with another, but can also communicate with any of the world's 1,3 million telex machines. And vice versa.

Close on 300 companies based in South Africa have installed teletex machines rented from Sapo.

Another 100 are waiting for terminals. The Post Office says it could cope with applications for several thousand machines a year.

Teletex rentals are R220 a month, with an installation fee of R230. Telex is only R70 a month. But, says a Sapo spokesman, teletex works out some 45 percent cheaper overall, taking into account rentals, call rates and its far superior speed and accuracy.

From April 1 the call rate for teletex and telex will be 8c a unit on the basis of 60 seconds a unit for "local" calls (subscribers linked to the same exchange) and for transmissions of up to 100km; 30 seconds from 101 to 200km; 15 seconds from 201 to 400km, and 12 seconds over 400km.

The rate for teletex will be 5,2 seconds for "local" calls and calls of up to 100km; 2,5 seconds from 101 to 200km; 1,6 seconds from 201 to 400km; and 1,3 seconds over 400km.

Where a teletex and telex communicate, the telex rate applies.

Because South Africa has been a pioneer in teletex, local subscribers may have to wait a while before they can send messages to teletex terminals in most countries.

But Sapo is arranging for test transmissions between Johannesburg and Frankfurt via Intelsat satellite.

If successful, a teletex service to West Germany could be in operation within three months, says Mr Gus Greve, Sapo's Director, Digital Services.

The German "gateway" could initially give South African users access to teletex subscribers in Austria, Canada and the United States.

Sapo does not see any serious conflict of interest from the fact that more and more communicating word processors — and micro and mini computers — are coming with built-in teletex abilities.

It is understood to be quite happy for private enterprise to share the capital burden (each teletex costs Sapo close on R9 000).

The Post Office will still make its money essentially from call charges.

The next big advance, the combination of teletex and digital facsimile, still looks like being several years away at least, says Sapo.

Telefax, as it's been called, would allow any transmitted letter to carry the company's logo at the top and the managing director's signature at the end.

A Japanese research team has come up with a telefax terminal that transmits complete, signed documents at high speed. At the receiving end these are printed by a laser printer.

Without going into detail, the team hints it has some way to go before the system is perfected. For one thing, there's the fundamental matter of cost.

CSO: 5500/69

VALUE OF COMPUTERS IN SOUTH AFRICA SPIRALS

Johannesburg THE STAR in English 12 Apr 84 p 15M

[Article by Melanie Sergeant]

[Text] The value of computers bought in South Africa has spiralled from about R340 million seven years ago to R890 million this year, according to Mr Cees Roon, president of the Computer Users Council and technical director of Barlow Rand.

Speaking at a meeting of the Computer Writers Guild, Mr Roon said these figures were conservative and could in fact be 25 percent below actual costs.

In working out the total investment in minis, super minis, medium mainframes and large mainframes, it was estimated that costs of hardware components, soft-ware, DP professionals and supplies have risen from R220 million in 1978 to R576 million this year.

"And this year we will probably have to add between R50 million and $80 million and for 1985 the additional expenditure on micro computers could be between R80 million and R150 million," he said.

The number of computers in South Africa climbed from 1 264 in 1978 to about 3 740 five years later--and this excludes micros and/or home computers as there are no reliable figures available.

He found investment in mainframes was the most significant. Large mainframes were seen to have the longest lifespan at about 60 months, with a depreciation of 20 percent a year.

Medium mainframes (valued at between R750 000 and R2 million) had a life cycle of 48 months and depreciation of 25 percent a year. The life cycle of super minis (costing between R 250 000 and R750 000) was estimated at 40 months and depreciation was 30 percent a year.

Minis (priced between R50 000 and R250 000) had a lifespan of 38 months and depreciated at 32 percent a year.

As far as micros were concerned Mr Roon said their lifespan was about 36 months with depreciation at 33 percent a year.

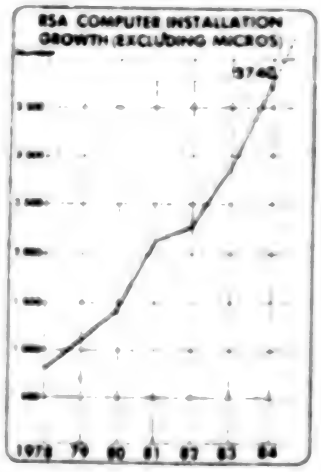
It was estimated 15 percent of micros or personal computers were abandoned in their first year of life, and increased to 50 percent in the second year.

"The short life-cycle is seen as the result of newer products with more software becoming available so rapidly that three years after having purchased a micro it often becomes economical to replace it with newer equipment."

As far as return on computer investments was concerned, Mr Roon said figures for added value range from 13 percent to 29 percent of the total budget figure of all installations.

This was calculated from the pay off in months of an application and the average usage installations make of such applications.

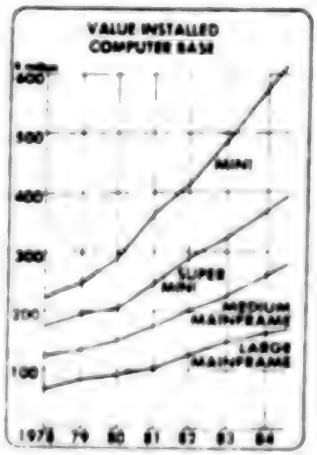
Figures for costs of components which go with the computer--such as staff, hardware, software and supplies--vary according to the type of computer in use.



As far as micros were concerned, staff (including benefits and premises) was responsible for 90 percent of the budget for computer installation; hardware accounted for about seven percent, software for two percent; and supplies for one percent.

Supplies include paper, magnetic tapes, power and office stationary (and these were relatively cheap for micros) were estimated at about five-percent of the large mainframe costs.

For these staff accounted for 50 percent of budget; hardware 30 percent; and software 15 percent.



As a percent of budget, staff soaked up 70 percent of expenditure on super mini investments, hardware 19 percent, software eight percent, and supplies three percent.

CSO: 5500/69

INTERNATIONAL ORGANIZATION OF MARITIME SATELLITE COMMUNICATION

Moscow RYBNOYE KHOZYAYSTVO in Russian No 3, Mar 84 pp 45-48

[Article by V. Ye. Anoshin, Morsvyaz'sputnik **[Maritime Satellite Communication], candidate of economics K. A. Bekyashev, Central Scientific Research Institute of** Information and Technical and Economic Research of the Fishing Industry: "The **International** Organization of Maritime Satellite Communication"]

[Text] The stormy growth of the activity of man on the oceans of the world leads to a significant increase in the volume of information being transmitted through radio communication channels. Thus, beginning in 1968 the growth in the volume of radio traffic on the maritime communication channels in the world amounted annually to an average of 5 to 10 percent for the telegraph and up to 10 percent for the telephone. This led to a significant overload of the frequency ranges assigned for traditional maritime communication.

The experience of the operation of the various satellite communication systems shows that the application of space technology is at the present time the most promising direction of the development of radio communication and radio navigation at sea. Moreover, space systems of information transmission make it possible to decrease significantly the time necessary for search and rescue services to receive distress signals and to determine the coordinates of the place of a wreck--which is important for securing efficient rescue activity and safety of man at sea.

These reasons induced the International Maritime Organization in the mid-1960's to study the problem of the use of artificial earth satellites for the needs of navigation. Under the leadership of the IMO Subcommittee for Radiocommunications and with the active participation of the USSR, the basic documents were elaborated for a new international organization--the Convention and the Operating Agreement on the International Organization of Maritime Satellite Communication (INMARSAT), adopted in 1976.

The Convention on the International Organization of Maritime Satellite Communication became effective on 16 July 1979, and as of this date the organization began to operate officially. And on 1 February 1982 the practical operating activity of the International Organization of Maritime Satellite Communication began.

On 1 September 1983, 39 states were members of the International Organization of Maritime Satellite Communication, including: The socialist states--USSR, Polish People's Republic, People's Republic of Bulgaria, and People's Republic of China; the capitalist states--United States, Great Britain, Norway, Japan, and others; and the developing states--India, Liberia, Algeria, and others. The authorized organizations, departments or firms of these countries are participants of the operating agreement on the International Organization of Maritime Satellite Communication (the interests of the USSR, as well as the BSSR and UkSSR as equal members of the International Organization of Maritime Satellite Communication are represented by the All-Union Association of Maritime Satellite Communication).

The purpose of the International Organization of Maritime Satellite Communication, according to Article 3 of the Convention, is the securing of a space segment necessary for the improvement of maritime communication, and the assistance thereby in the satisfaction of the needs of sailors for more perfect means of communication, the increase of the safety of navigation, the preservation of human life at sea, the efficiency of navigation, as well as the improvement of fleet control.

In its activity, the International Organization of Maritime Satellite Communication is guided by: The principles of universality and non-discrimination, according to which all states and their ships are granted satellite communication and any state has the right to become a member of the International Organization; the principle of the maintenance of peace and international security, in accordance with which the organization carries out its activity exclusively for peaceful purposes; the principle of the sovereign equality of states, according to which all members of the International Organization of Maritime Satellite Communication, regardless of state order and prosperity, have identical rights and obligations.

Apart from the principles laid down in the Convention, the International Organization of Maritime Satellite Communication is guided by the principles of the Charter of the United Nations and the Agreement on the Activity of States With Respect to Research and Use of Space, including the moon and other celestial bodies of 1967 (Preamble of the Convention).

The basic organs of the International Organization of Maritime Satellite Communication are the assembly, the council and the directorate.

The assembly -- the highest organ of the organization, in which all member states are represented--determines the policy and forms of activity of the International Organization of Maritime Satellite Communication and in addition elects 4 representatives to the council. The functions of the assembly include the examination and study of the activity, general policy and long-term goals of the organization. On recommendation of the council, the assembly issues permission for the creation of additional possibilities of the space segment.

The session of the assembly meets once every two years, and in extraordinary session--atthe request of one-third ofthe states or the council. On 1 January 1984 three regular sessions had taken place.

The council is the executive organ of the International Organizatin of Maritime Satellite Communication. Its composition includes 22 representatives of the participants in the operating agreement: 18 representatives of participants or groups of participants not represented in any other way and which have agreed on group representation, which have the greatest proportionate share in the organization; 4 representatives of participants elected by the assembly without regard to their proportionate share for the purpose of preserving the principle of fair geographic representation, with due regard for the interests of the developing countries.

The constitutive act of the International Organization of Maritime Satellite Communication allows the possibility of the unification of several countries and the designation of one representative with a total proportionate payment of dues. For example, the USSR, the UkSSR and the BSSR appointed as their representative the All-Union Association of Maritime Satellite Communication (in conformity with the size of the dues payment, it has 14 votes). The Netherlands and Belgium, which have united into one group, as well as Sweden and Finland, have 1 representative each and respectively 3.5 and 2.5 votes.

Auxiliary organs of the council are committees for technical-operating and financial questions.

The International Organization of Maritime Satellite Communication is financed through dues of the participants. Every participant of the operating agreement covers the capital requirements of the organization in proportion to its share of dues, which in the first stage of the creation of the organization was established empirically, and after the first two years of the practical operation of the system of the International Organization of Maritime Satellite Communication and subsequently will be determined annually in proportion to the actual use of the system by the ships of the participant states. As compensation for invested capital and remuneration for its use, the participant receives sums in accordance with conditions established by the council.

The quota duesof the participants are regularly examined and put into effect with an interval of 1 year after the first determination of the quota dues on the basis of the utilization of the segment, taking into account its use by all participants during the preceding year, from the moment of the effectiveness of the operating agreement for a new member, the departure from the organization or the termination of membership of any participant.

On 1 October 1983 the dimensions of the proportionate share in the capital of the International Organization of Maritime Satellite Communication was (in percent): USSR--14.07801; United States--23.34024; Great Britain--9.88140; Norway --7.87029; Japan--6.99212; Polish People's Republic--1.67602; People's Republic of Bulgaria--0.27176; and Tunesia--0.05000.

At the present time, the maximum capital of the International Organization of Maritime Satellite Communication amounts to 300 million dollars.

According to a statement by the director general of the organization, O. Lundberg: "The International Organization of Maritime Satellite Communication can offer communication services to the entire maritime society. Such communica-

tion has many advantages, including great speed, quality and reliability, which cannot be secured by traditional communication. We can offer to the world community practically all types of communication used on earth. I can confidently predict that the day will come when practically all ships will enjoy the advantages of maritime satellite communication."*

At the present time, more than 2,000 ships in the world, including 40 fishing vessels, are equipped with the appropriate apparatus for the satellite communication system of the International Organization of Maritime Satellite Communication. In the opinion of O. Lundberg, by 1990 more than 10,000 ships will use the services of the International Organization of Maritime Satellite Communication.

The future use of the International Organization of Maritime Satellite Communication (IOMSC) system on ships of the commercial fleet is of special significance. Fishermen located in regions of small-scale fishing can effectively communicate, including also with the aid of the telephone with the shipowner and with their relatives. Through IOMSC it is possible to transmit information effectively to ships when schools of fish are discovered, especially when it is impossible to secure quality communication via short wave. IOMSC is practically capable of securing global communication for the world fleet, i. e., communication with every point on the world's ocean (with the exception of the polar regions). For this reason it is no accident that Japan has adopted a program of equipping large trawlers, refrigeration and processing ships with the IOMSC system in the near future. In the opinion of Japanese specialists, this measure will be conducive to the increase of the volume of the catches, as well as the rapid sale of the products processed at sea.

By 1985 it is proposed to equip 25 percent, and by 1990 40 percent, of the fishing vessels with a tonnage of more than 1,000 tons with ship stations for the utilization of the IOMSC system of satellite communication. On fishing vessels with a tonnage of 300 to 1,200 tons, the installation of equipment for satellite communication is not proposed because of the difficulty of the installation of antennas with a significant coefficient of amplification.

The IOMSC system includes the space segment, coastal ground stations (BZS), ship ground stations (SZS) and a control system. The IOMSC may be the owner or the leaseholder of the space segment. The space segment of the IOMSC may be utilized by the ships of all countries on conditions that are established. In the determination of the conditions, the council must not discriminate in terms of national indication.

In every concrete case, the council may decide on the utilization of ship ground stations in installations which are not ships, but are operated in a maritime environment, when the work of such stations does not cause serious difficulties for service of the ships. Any application for the utilization of the space segment of the IOMSC is submitted to the organization by a participant, and in the case of a territory not under the jurisdiction of a participant--by an authorized organization of telecommunication. Permission for utilization is issued by the organization in accordance with the rules established

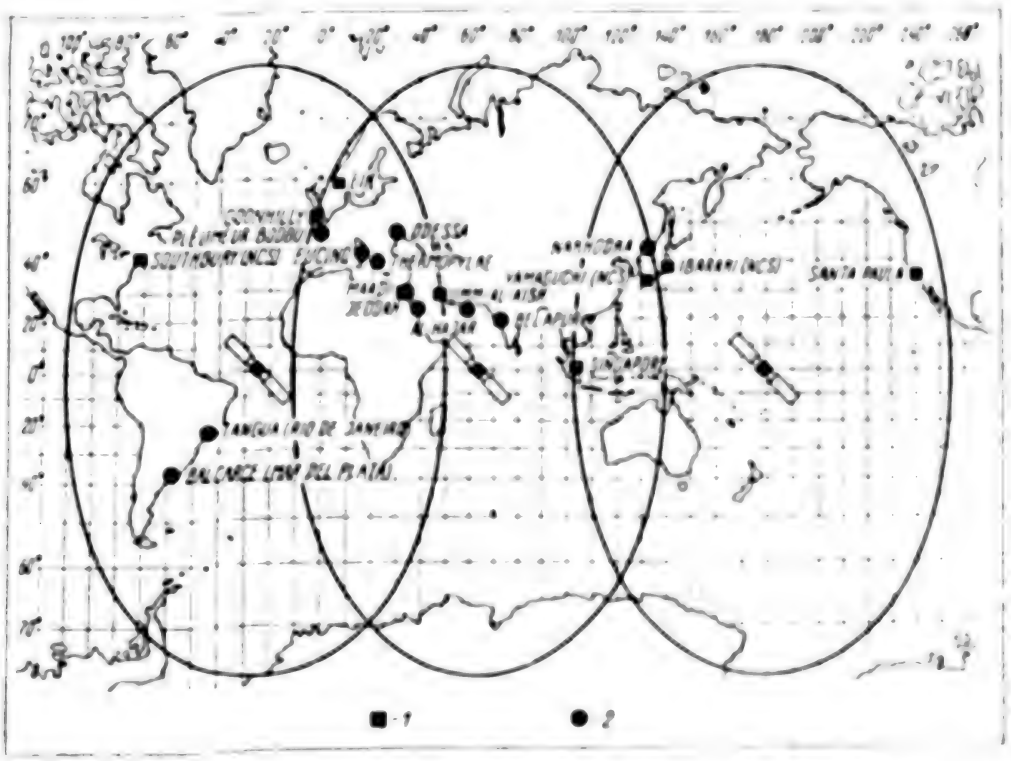
*) OCEAN VOICE, April, 1982, p 2.

by the council. Every participant or authorizing organization for telecommunication which has been given permission to utilize the space segment of the IOMSC is responsible for the observation of all established conditions for use. This provision is applied when an application is submitted by a participant, if the side designating the participant does not assume responsibility for the permissions issued to all or to some ground stations that are not owned by the participant or are not operated by the participant.

Permission of the organization is required for the utilization of the space segment of IOMSC by all ground stations. Applications to receive such permission are submitted by the participant of the side on whose territory the fixed ground station is or will be located, by the side itself or by the participant designated by the side, with whose permission the ship ground stations or the ground ship stations of installations being used in a maritime environment are operating. Every applicant bears responsibility to the organization for the observance of the procedure and norms of work by the stations.

In 1979 the World Conference for Radio Administration assigned the frequencies 4 to 6 HHz for maritime satellite communication.

In the first generation of the space segment, three types of satellites are used as operating, as well as spare satellites (Picture 1), sent into geostationary orbit: Marisat (launched in 1976, secure 7-10 channel of communication), Mareks (launched in 1981, secures up to 40 channels), and Intelsat V--MCS (launched in 1982-1983, provide for up to 30 channels of communication).



(1) Рис 1 Схема охвата Мирового океана спутниковой связью системы ИНМАРСАТ
1 — эксплуатируемые, *2* — планируемые станции

Key:

1. Sketch of the World Ocean satellite communication system of IOMSC.

At the present time, the technical requirements have been elaborated by IOMSC for the satellites of the second generation (see Table). Proposals for the conclusion of a contract for the launching of the satellites have been received from the USSR, the United States, and France. The satellites of the second generation will have 125 channels and more for work in the directions shore to ship. With the aid of various technical methods, the number of channels may be increased to 250. In the opposite direction the number of channels will be approximately 250.

At the present time, payment for the utilization of a space segment is effected in accordance with the following rates: $2.40 per 1 minute for the telegraph-telex mode; $5.25--per 1 minute for the telephone mode; $8.00--per 1 minute of high-speed transmission; $7.20--per 1 minute of a group call. For organizations which are not participants of the operating agreement of the IOMSC, other rates can be established.

Calls being made from shore to ship are paid by calling subscription, and calls made from ship to shore--by the shipowner.

According to IOMSC data, the volume of correspondence transmitted through satellite communication in 1 minute in 1982 came to 2,100,000 minutes for the telephone, 3,300,000 minutes for the teletype.

(1) Океанские районы	(2) Функция спутников	(3) Положение на орбите	(4) Трехрайонная система (дата выпуска)	(5) Четырехрайонная система (дата выпуска)
(6) Восточная часть Атлантического океана	(11) Эксплуатационный	11,0–19,0° з. д. (15)	(17)	(17) Август 1988 г.
(7) Центральная часть Атлантического океана	(12) То же	25,5–27,5° з. д. (15)	Август 1988 г.	
	(13) Запасной	(12) То же	(18) Декабрь 1988 г.	(18) Декабрь 1988 г.
(8) Западная часть Атлантического океана	(14) Эксплуатационный	50,0–58,0° з. д. (15)		Январь 1991 г.
(9) Индийский океан	(12) То же	62,0–69,0° в. д. (16)	(19) Июль 1988 г.	(19) Июль 1989 г.
	(13) Запасной	(12) То же	Январь 1990 г. (20)	Январь 1990 г. (20)
(10) Тихий океан	(14) Эксплуатационный	176,0–179,0° в. д. (16)	Октябрь 1990 г. (21) Июль 1991 г. (19)	Октябрь 1990 г. (21) Июль 1991 г. (19)

Key:

1. Ocean regions
2. Function of satellites
3. Position in orbit
4. Three-region system (date of launch)
5. Four-region system (date of launch)
6. Eastern part of Atlantic Ocean
7. Central part of Atlantic Ocean
8. Western part of Atlantic Ocean
9. Indian Ocean
10. Pacific Ocean
11. Operating
12. Ditto
13. Spare
14. Operating
15. West longitude
16. East longitude
17. August
18. December
19. July
20. January
21. October

However, the payment for the utilization of a space segment of the IOMSC is not collected for giving an initial distress signal. Upon the decision of the council, payment is not collected for the utilization of the telephone channel of the IOMSC in the coordination of work during the testing of buoys--indicators of calamities, which are an element of a satellite system for providing search and rescue operations at sea that is being created. The essence of this system consists in the guidance in the emergency radio buoy through the satellite system of communication of the appropriate rescue service and simultaneous processing of up to 20 signals.

The coastal ground stations are constructed and are operated by the participants in accordance with the technical requirements of the IOMSC. According to Paragraph 3, Article 7 of the Convention, ground stations on dry land, operating through a space segment of the IOMSC, are located within the bounds of land territory under the jurisdiction of some side, are the complete property of the side or organizations subordinated to its jurisdiction.

The basic function of coastal ground stations is the realization of communication with ships through satellites and the securing of cooperation with the national and international networks of communication. Every coastal ground station provides telephone and teletype channels of communication.

For the work of the coastal ground stations, the following frequency bands are recommended: In the transmission to the satellite 6410 to 6425 MHz; in the reception from the satellite 4180-4200 MHz. As a rule, the coastal ground stations consist of a parabolic bowl-shaped antenna of 10 to 13 meters in diameter, which is constantly aimed at the operating satellite located above the ocean region; receiving and transmitting equipment; and a processor controlling the work of the station.

On 1 November 1983 8 coastal ground stations were put into operation at the following points: Yeyk (Norway), Ibaraki and Yamaguchi (Japan), Singapore (Singapore), Santa Paula and Southbury (United States), Goonhilly (Great Britain), and Umm-Al-Eykh (Kuwait). In the very near future, two stations will be put into operation on the territory of the USSR--in Odessa and Nakhodka.

Ship ground stations are terminals of satellite communication, which are obtained or leased by individual shipowners or operators from firms which produce these stations or corresponding ship equipment. They operate on a frequency of 4 to 6 MHz.

The distribution of the ship ground stations is shown in Picture 2.

For the technical control of the IOMSC system, an operating control center (EKTs) has been created, which operates around the clock. The operating control center realizes the control of the technical parameters of the space segment in its usual work; the realization of the reserve and transitional plans; the coordination of tests for the approval of types of ship stations; the coordination of tests of new coastal ground stations; the assessment of the results of tests and delivery of permits for the access of coordination stations of the communication network, coastal ground stations and ship ground stations, to the

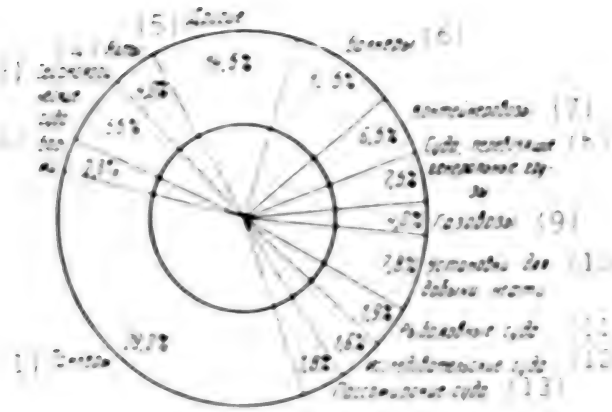


Рис. 2. Распределение судовых земных станций на 1 июля 1983 г.

Key:

1. Tankers
2. Barges
3. Seismographic ships
4. Yachts
5. Others
6. Bulk carriers
7. Container carriers
8. Ships carrying general cargo
9. Gas carriers
10. Installations for the extraction of petroleum
11. Fishing vessels
12. Research ships
13. Passenger ships
14. Picture 2. Distribution of ship ground stations on 1 July 1983

space segment of the IOMSC; and the securing of operating information of the coordination stations of the communication networks, coastal and ship ground stations.

8970
CSO: 8500/1012

EUROPEAN COMMISSION REJECTS LATEST IBM PROPOSALS

Paris LIBERATION in French 27 Apr 84 p 4

[Text] Wednesday, the European Commission rejected the latest IBM proposals to settle the dispute begun in 1980, in which the American manufacturer was accused by the EEC of abusing its dominant position in the European market. If an agreement is not reached between now and next June, the Commission could order IBM to inform European companies of modifications or innovations introduced into the configuration of the network of its systems 1 month after announcement of the introduction of a new computer. Anyone not familiar with the realities of the computer market may be astonished by the demand that a manufacturer reveal to his competitors information about his new equipment.

The managing director of IBM-France, Jacques Lemonnier, did not fail to advance this argument last December in a letter to LE MONDE. Of course, it is nonetheless true that IBM's dominant position in the European market where the company has 50 percent of the market for general-purpose computers and 90 percent of the compatible hardware market must be taken into account. At least that is the view of the European Commission. IBM is in a quasi-monopoly position and no manufacturer dares ignore what the giant does before coming out with a new piece of equipment under penalty of seeing major parts of the market effectively barred to it. At present, 1 or 2 years may go by between announcement of the introduction of a new computer and its marketing. During this period, manufacturers of compatible equipment are kept at a standstill pending the appearance of the new product, whose characteristics are unknown to them.

8143
CSO: 5500/2668

BRIEFS

VIDEOTEXT SERVICE STARTS--In the beginning of March the Postal and Telegraph Service will begin a nation-wide videotext service after a 2-year experimental period. The clients of this tele-data service are now and in the near future will almost exclusively be business enterprises. Household use will probably become more prevalent after a few years, states the Postal and Telegraph Service. [Text] [Helsinki HELSINGIN SANOMAT in Finnish 1 Mar 84 p 7] 10576

ADVANCED SATELLITE-TV ANTENNA--Turku--The Teleste Company of Turku has developed a new generation of satellite-tv antenna equipment, by which the noise level has been reduced from the present 4.0 decibels to 2.5 decibels. At this time no competitor is capable of offering a better performance according to Teleste. As a result of this improvement a better picture can be obtained with the present antenna or inversely stated: the same picture quality with an antenna that is approximately 25 percent smaller at the diameter. An automatic deicing system has been developed for Teleste's mirror antennas. An electronic weather station directs the melting system based on the use of warm air. To date Teleste has sold satellite receivers to the larger European cable television systems. The clients have been, among others, the postal administrations of Finland, Sweden, Norway, Switzerland and Holland. Teleste began its development work on satellite receiver equipment in 1978 in cooperation with VTT [State Technical Research Center]. [Text] [Helsinki HELSINGIN SANOMAT in Finnish 25 Mar 84 p 39] 10576

CSO: 5500/2663

REPORT OF FRENCH FIBEROPTIC COMMUNICATIONS PROGRAM

Stockholm UTLANDSRAPPORT FRANKRIKE 8308 in Swedish Dec 83 pp 3, 15-33

[Report by graduate engineer Karl Gunnar Nilsson of the Technical and Scientific Attache Bureau in Paris: "Fiberoptic Communication in France"]

[Excerpts] SUMMARY

The use of optical fibers in communications technology is an area which invites debate. From a purely technical aspect there are numerous advantages compared to coaxial cables: greater capacity for both transmission speed and transmission distance, insensitivity to interference, etc.

On the other hand, many experts are doubtful whether optical fiber technology is quite ready for application on a large scale, particularly since fiberoptic communications systems are often considerably more expensive than systems using coaxial cable.

For various reasons France has plunged headlong into a major project, "Plan Cable," the objective of which is that toward the end of the 1990's all French households are to be connected to a national optical cable network with both interactive services as well as more traditional cable television. This effort is presented in the report.

Additionally, there is a brief discussion of a few other projects which use fiberoptics as a transmission medium, industrial companies with fiberoptics on their program and research being conducted in the field.

The report is written by graduate engineer Karl Gunnar Nilsson of the Technical and Scientific Attache Bureau in Paris.

2 The French Fiberoptic Cable Network (Plan Cable)

It is quite well known that in November 1982 the French government made a decision to supply the entire country with a fiberoptic network. The forms for its implementation and the current situation (October 1983) will be briefly presented.

2.1 Goals and Preconditions

In an initial phase up to the end of 1985/beginning of 1986, local networks are to be built in various places of the country. It is anticipated that 1.4 million households will be connected at that time. Afterwards, the local networks will be connected with each other by means of cable, fiberoptical or coaxial, and 1 million new households per year will be connected to new local networks.

During the first phase, communication in only one direction is permitted, that is to say primarily the distribution of television programs. Other possibilities are the distribution of hifi sound or links to the telephone network. When the entire network is operational, all transmission will take place digitally with opportunities for interactive services, such as video telephone, "video libraries" and teledata.

The local networks are to be operated by so-called SLEC (Local Associations for Commercial Exploitation) under supervision by the DGT [expansion unknown]. Interested municipalities must submit an application to the DGT, which after approval will finance 70 % of the costs. The remainder will be paid by the respective SLEC. These remaining 30 % are to be repaid gradually by the DGT to each SLEC.

At the same time the DGT has asked for bids from potential manufacturers of the fiberoptic networks included in the initial phase. The only requirement imposed was that the networks should be star-shaped with fiberoptic cable. The calculated price was 5,000 francs per hookup, of which the state, as was mentioned, would directly finance 3,500 francs.

This "Plan Cable" is a major, expensive effort which has caused many comments and speculations. A large part of the discussion revolves around industrial-political reasons. The plan will create jobs and in the long run may give the French electronics industry a good position within fiberoptic communication. The disadvantage is that the technology is still very expensive. One of the people interviewed for this report believes that France is 5 years behind in building coaxial cable networks and 5 years ahead in building cable networks with fiberoptics. A fact that has all but disappeared in all the miles of newspaper columns on industrial-political and cultural-political strategy is that if France is to build any form of cable network, fiberoptics could nevertheless become relatively inexpensive. The reason for that is the diameter of the existing conduits through which telephone cables and similar cables are conducted. In France these conduits are considerably narrower than the equivalent ones in other European countries. They are not sufficient for laying networks of coaxial cable but ample for fiberoptical cable. By using these existing conduits, considerable sums can be saved which would otherwise have to be spent on laying new conduits.

2.2 The Current Situation

In October 1983 PTT [Posts and Telecommunications] Minister Louis Mexandeau signed the first contract for expansion of a local network. It was the city of Montpellier which was thus honored. In 1985 20,000 connections are to be ready for use. Work will begin in January 1984. Both interactive services, cable television and local television will be offered.

A total of 70-80 applications for a total of about 2.5 million connections have been received by the DGT, which means that far from every one can be approved. Among the cities that presented the most advanced projects, which are also considered to have the best chances of being approved, are Metz, Biarritz, Evry and la Grande Sainte. Paris is also said to be in a favorable position.

Industry has also shown great interest. A number of proposals for manufacture of the local networks in the first phase have been received by the DGT. Of these, Saunier Duval (St. Gobain) was quickly eliminated. The next proposal to be rejected came from Philips subsidiary Portenseigne. This was based on a digital solution and was considered far too expensive for the first phase, while it might still be of interest to the next phase, when all transmission is to take place digitally. The most recently eliminated proposal belongs to CIT-Alcatel/Cable de Lyon, both a part of the CGE [Compagnie Generale d'Electricite; General Electric Company] group. Its proposal was considered based on a poor technical solution and too expensive.

The three remaining proposals come from LTT [Lignes Telegraphiques et Telephoniques; Telegraph and Telephone Lines], which is a subsidiary of Thomson, Velec/CGCT [Compagnie Generale de Constructions Telephoniques; General Telephone Construction Company] and SAT [Societe Anonyme de Telecommunications; Telecommunications Corp.]/Tonna. (These companies will be presented in more detail further on in the report.) Of these, the DGT will choose two from whom manufacture of the planned 1.4 million connections by 1986 will be ordered.

Of all the proposals mentioned above, there is not one in which the cost per connection is as low as 5,000 francs; 10,000 and perhaps even 15,000 francs are figures which are believed more realistic. The DGT hopes to make the choice of the two industries to receive the orders before the end of 1983.

3. Applications

Depending on what type of system the fiberoptics use, various requirements will be imposed on its transmission capacity. In cities and densely populated areas the transmission distances will be relatively short, so it is not necessary to use repeaters in the network. This applies even more to local networks and for various industrial applications. Relatively low capacity cable can be used.

3.1 Telephone Connections

Because of the modernization 10 years ago by France of its at that time almost catastrophic telephone network, digital telephone exchanges have been introduced to a large extent. It is calculated that 30 % of the telephone transmissions in France take place digitally. Digital technology is well suited for fiberoptic cables, and a number of experiments have been conducted or are in the process of being made. One of the first was to connect the Tuileries and Philippe Auguste telephone exchanges in Paris. It was LTT (Thomson-CSF) which supplied the material, and the exchanges were installed in August 1982. The distance between the exchanges is 7 km. The diameter of the cable is 21 mm and contains 7 bundles of the "grooved cylindrical" type. Each bundle can hold 10 fibers, that is to say a total of 70 fibers, which gives a capacity of 16,000 telephone lines. In the initial phase 4 two-way connections were used, with the transmission frequency 34 Mbit/s and an 800-nm laser as a light source. The fiber has a damping constant of about 2.5 dB/km.

A similar connection exists between the Poncelet and St. Lambert exchanges, where the transmission distance is 10 km. Here as well LTT delievered the equipment.

In this connection the hookup between the radio link and the Dijon-Flavignerot telephone exchange may also be mentioned. The distance is 10 km, frequency 34 and 140 Mbit/s, and a laser diode with 850 nm wavelength as well as a light diode with 1,300 nm wavelength are used. CIT-Alcatel, together with CLTO [Compagnie Lyonnaise de Transmission Optiques; Optical Transmission Company of Lyon], is responsible for the technical construction.

The abovementioned applications do not use repeaters due to the relatively short transmission distances. An experiment in transmission over longer distances is being conducted. It involves a connection first between Le Mans-La Fleche (about 50 km) and further between La Fleche-Angers (this distance is also about 50 km).

The idea is to have repeaters after each 25-km-stretch, a light wavelength of 1,300 nm from the laser source and 140 Mbit/s as transmission frequency. Gradient index fiber was to have been used from the beginning, but the possibility of using single mode fiber has also been studied. Two suppliers have been contacted: CIT-Alcatel together with Cables de Lyon and SAT in cooperation with LTT.

3.2 Cable TV

In addition to what was previously said about French fiberoptic cable networks and Montpellier, two larger projects exist for which the main objective so far is the transmission of television programs and in which fiberoptical cable is used. However, it is important to point out the interactive possibilities with consultation of databases, video telephone, etc.

One of these projects is under way in Lille. To begin with, 50 subscribers in the Saint-Sauveur area will be connected. In addition to the three French channels, they will be able to receive 10 or more of the television channels of the neighboring countries, as well as a local channel with information such as what is happening in the surroundings. Further, 20 channels with hifi sound will be available. Each subscriber will be able to choose two of these.

The architecture is star-shaped with a central station, a primary network connecting a number of substations to which the subscribers are connected and where they choose which channels are to be hooked up to their particular outlet.

This network will be tested and evaluated during 1984. If the result is positive, another 3,000 subsribers will be connected in 1985-86.

Four interested parties are involved in the project: the city of Lille, with surrounding municipalities, the DGT, TDF [Telediffusion de France; Telecommunications of France] and the LTT company. Of these, LTT has principal industrial responsibility and is funding the substations. By contract with Lille, LTT will also furnish and maintain the main exchange and fiber cables from the substations to the subscribers, as well as the equipment required in the homes, and by contract with DGT the primary network from the main exchange to the substations. TDF will install the receiver equipment required to receive the foreign television channels, and define the requirements for the main exchange. The estimated costs, according to the 1981 monetary value, are 3.5 million francs for the Lille municipal connection, 3.5 million francs for DGT, 1 million francs for TDF and 3.1 million francs for LTT. To this must be added the 10 million francs in expenditures which Lille has already spent for preliminary studies and planning since 1979.

In Biarritz a somewhat more extensive project is being undertaken, which has also progressed further than the Lille project. In Biarritz as well it is a matter of an experiment. First, 1,500 households will be connected, but maximum capacity for the system is 5,000 connections. The services that are being offered at the start are video telephone, television and hifi sound. The subscriber can choose 2 out of 15 television channels, 1 out of 12 radio channels. In the future there are also possibilities for video data bases, video libraries and similar. The three city sectors in question are in a radio shadow.

SAT has principal responsibility, but the equipment is being delivered by SAT and LTT together. The network is of approximately the same construction as in Lille, with a main exchange and substations. From the substations cables with 70 fibers are laid to the subscribers. At special juncture points these 70 fibers are split into cables of 10 fibers, which are led to a box, to which the subscribers are connected with a hookup box. Each subscriber has 2 fibers available to him, one for each direction.

The type of fiber used is 50/125 µm gradient index fiber, manufactured by means of the modified chemical vapor deposition method by FOI [Fibres Optiques Industries; Fiberoptical Industries]. The fiber has a damping of 4 dB/km and a bandwidth of 150 MHz for 2.5 km. Light wavelength is 850 nm from a laser diode (manufactured by General Optronics). The detector in the receiver is an avalanche photo diode.

All signals except telephone sound and control signals are transmitted with frequency modulation. The telephone sound is recoded into digital form at a pulse of 64 kbit/s, which is later multiplied with the control signal to 128 kbit/s. This signal is then superimposed on a carrier wave and transmitted in amplitude-modulated form.

The Biarritz project has been somewhat delayed. Connection had cautiously begun in October, but then only to hotels. Certain problems were encountered with the video telephone (manufactured by Thomson). The costs being mentioned are about 200,000 francs per connection or a total of 300-500 million francs.

3.3 Local Networks

CCETT [Centre Commun d'Etudes de Telediffusion et Telecommunications; Joint Center for Telediffusion and Telecommunications Studies], which is a joint research center for TDF and PTT, has produced a local communications network primarily intended for industrial communication. The network is called CARTHAGE, which is said to stand for Commutateur a Acces Reparti pour Terminaux Heterogenes Adapte a la Gestion des Entreprises [Distributed Access Converter for Heterogeneous Terminals Adapted for Industrial Management], and is based on fiberoptic transmission. The idea is to integrate both teledata and data communication, video communication and telephone. A prototype is being installed in the new CCETT premises at Cesson-Sevigne outside Rennes.

Geographically, the network is constructed in star shape with 8 cables of 36 fibers each branching out from a central point. Physically, at present two fibers from each subgroup are series coupled at this central point, so that the result is in fact a loop of two fibers, to which eight subexchanges are connected. Connected to the subexchanges are for example telephone and data terminals. In today's situation the video signals are transmitted with coaxial cable, but these as well will be integrated into the fiberoptics network.

An interface can also be hooked up for telephone exhanges, existing data communications networks, internal computer centers etc.

Transmission takes place in synchronization with the frequency 8 Mbit/s, in "packages" of 125 µs, in which the control, speech and data signals are contained. The frequency for speech (telephone) communication is 64 kbit/s and for data 2.4 to 48 kbit/s.

Here as well the type of fiber used is 50/125 µm gradient index fiber, and it is the Velec company which together with CGCT delivers the equipment. The development costs are about 5 million francs.

3.4 Monitoring System

In a high-voltage laboratory in Les Renardieres, belonging to Electricite de France (roughly corresponding to the Swedish Waterfall Agency), LTT has installed a fiberoptic monitoring and data gathering system. It consists of 22 stations connected to a central unit, that is to say this system is also star-shaped.

This environment is unsuitable for conventional copper cable systems. Electric fields of 30 V/M in the 1 MHz to 200 MHz frequency range and differences in potential of up to 20 KV between the ground points of the various stations can occur.

Transmission takes place in full-duplex mode, synchronous or asynchronous, depending on the equipment of the individual station. This is frequency modulated, so that a logical "zero" corresponds to 0.5 MHz and a logical "one" corresponds to 1.5 MHz. The modem used is an LTT TRADAN 1505.

The light pulses are generated by an 850-nm light diode and detected by a PIN photodiode. The optical fiber used is a 200/600 µm step index fiber, manufactured by FOI.

Another system, also manufactured by LTT, in an environment of interference is an integrated monitoring and communications system in the Lyon subway. This contains a telephone link, television monitoring and hifi sound transmissions for five of the subway stations. The system is something of a hybrid with mainly fiberoptic cable, but also with copper conductor.

The telephone link is two-way with the frequency 34 Mbit/s. Besides telephone it transmits control signals for the television monitors.

Television monitoring is accomplished with 2-4 television cameras per station. The television center is located at the Henon station, and two cameras are chosen by means of the telephone line. The two video signals are then transmitted by fiberoptics to the control center, where two television monitors are located. The type of fiber used here has two wavelength windows, which can enable optical multiplexing in order to be able to transmit more camera signals simultaneously.

The sound, finally, has a range of 40-50,000 Hz, a signal/noise ratio of 60 dB over a maximum transmission distance of 6 km.

The advantages of fiberoptics in this case are partly due to the relatively noisy electrical environment, partly the simpler maintenance since there are no repeaters, as well as a relatively simple potential expansion capability of the network. It will be put into operation in August 1984.

Other examples are television monitoring of the Paris police prefecture, SNCF (French National Railroads) and at Roissy between the Charles de Gaulle 1 and 2 airline terminals.

3.5 Underwater Cable

In telephone lines intended to be laid under water the properties of fiber cables are very useful: both the long transmission distances and the great bandwidth, which permits many lines per physical conductor. One company in France, Submarcon, which is a joint venture enterprise between CIT-ALcatel and Cables de Lyon (both within CGE), devotes itself to this activity. Two experiments have been undertaken. The first test was done in 1982 with a 20-km-long cable along the French Mediterranean coast between Antibes and Cagnes. The other one, also in the Mediterranean, is in the process of being carried out. It connects Antibes and Port Grimaud, an approximately 80-km-long stretch, with a maximum depth of more than 1,000 m. In the first case no repeaters are used under water, in the second prototypes manufactured by CIT-Alcatel are used.

In the most recent and largest experiment a light wavelength of 1,300 nm is used and a transmission frequency of 280 Mbit/s, which gives 3,840 telephone channels per fiber. The cable contains four fibers, one for each direction, that is to say the total number of telephone channels are 2 x 3,840. The repeaters receive their control signals via the optical fibers, without disturbing the traffic. In order to increase reliability they contain four laser diodes for each fiber; which one is to be used is determined via the control signals. In 1985 a fiberoptic telephone cable will be laid between the French mainland and Corsica. It will be of the same type as in the abovementioned experiment and the distance is about 200 km.

In underwater applications the single mode fiber is the best alternative because of its longer transmission distance and greater bandwidth. CLTO, which manufactures the fibers, has set the goal of tolerating a damping less than 0.4 dB/km and a distance greater than 57 km between the repeaters.

Submarcon is involved in the struggle regarding who will be allowed to manufacture the next Atlantic cable, TAT 8, which will be fiberoptic. The other "fighters" are ATT (United States), STC [expansion unknown] (Great Britain) and KDD [expansion unknown] Japan.

4 Industry

Since fiberoptics in principle is only a new way to transmit information, it is natural that companies that have previously worked with telecommunications will acquire experience in this new technology as well. This applies to both transmitters/receivers, components and connection devices and cables. In principle it is only the fibers that are manufactured by somewhat more specialized industries, which often, however, are subsidiaries of a major cable or electronic manufacturer.

Before each individual company is presented, it should be mentioned that extensive restructuring is under way between the two large groups in the electronics industry in France. This applies to CGE, Compagnie Generale

d'Electricite and Thomson-CSF, both nationalized. The agreement says that CGE will take over the telecommunications activities of the groups and that Thomson will take over the component, home electronics and defense electronics sectors of the two groups. This is to be completed no later than January 1987.

The following presentation includes the major French companies that deal with fiberoptic communication. It contains gaps, but will hopefully provide a reasonably complete picture of French industry in that area.

4.1 System, Transmitters, Receivers etc.

LTT = Lignes Telegraphiques et Telephoniques [Telegraphic and Telephonic Lines] is a subsidiary of Thomson-CSF. (Address: 1, rue Charles Bourseul, B.P., 78702 Conflans-St-Honorine Cedex. Telephone: 3/974 56 56. Telex: 696 808 F.) Turnover 1,100 million francs in 1982. Number of employees about 3,500. Stock capital 45 million francs.

In its product line the company has transmission systems for 2 Mbit/s and 34 Mbit/s, respectively. Further, they make fiberoptic video transmission units and optical modems for shorter point-to-point connections.

LTT has participated and is participating in many experiments, of which the largest, the cable television network in Lille, the monitoring systems in the EDF high-voltage laboratory and in the Lyon subway, are presented elsewhere in this report (Chapter 3.2 and 3.4). LTT has also submitted an all-French proposal regarding the local networks for Plan Cable, and supplied portions of the equipment for the Biarritz network.

Last fall Thomson-CSF entered an agreement with U. S. General Instruments for two joint subsidiaries to be formed in each country. These subsidiaries will link the knowledge of the two companies in the coaxial and fiberoptics technologies, that is to say LTT is highly involved.

LTT has taken over the group within TRT (the Philips group) which worked with fiberoptics.

CIT-Alcatel (Address: 33, rue Emeriau, 75725 Paris Cedex 15. Telephone: 1/571 10 10. Telex: 250 927 F.). Number of employees about 16,000 (of which 4,500 in the transmission sector). Stock capital 137 million francs. Turnover (transmission area) 1,500 million francs in 1982.

The company is part of the state-operated CGE group (CGE = Compagnie Generale d'Electricite [General Electric Company]), and in addition to fiberoptic transmission systems for telephone links (Alcatel BR 10) it also produces equipment for underwater cables with single mode fibers for 1,300 nm light wavelength and the transmission frequency 280 Mbit/s.

For the video communications network (Plan Cable) a system called SAFODIS was presented. The experiments in which CIT-Alcatel took part are a connection between a radio link antenna and a telephone exchange in Dijon (installed at the end of 1981) and the two experiments with underwater cable outside Antibes.

SAT = Societe Anonyme de Telecommunications [Telecommunications Corp.]. (Address: 41, rue Cantagrel, 75624 Paris Cedex 13. Telephone: 1/582 31 11. Telex: TELEC 250 054 F.) Number of employees about 7,000. Stock capital 137 million francs.

SAT is a privately owned company with great experience in the telecommunications field. A large variety of products are offered in digital teletransmissions systems, and together with antenna producer Tonna Electronique it has installed about 15 local television networks. In fiberoptics may be mentioned SAT's system responsibility for the Biarritz project and the Carlieu-Belimont and Bayonne-Biarritz telephone connections.

Like the other "big ones," SAT has a complete video communications system, Optel 500, based on a star-shaped fiberoptic network.

Together with General Optronics, USA, SAT has formed the subsidiary Europtronique for transmission and reception components.

CGCT = Compagnie Generale de Constructions Telephoniques [General Telephone Construction Company]. (Address: 251, rue de Vaugirard, 75740 Paris Cedex 15. Telephone: 1/545 20 00. Telex: 200 059.) The company has been nationalized since the spring of 1983, was previously a subsidiary of ITT.

CGCT participates with Velec in the CARTHAGE project at CCETT [Centre Commun d'Etudes de Telediffusion et Telecommunications; Joint Center for Telediffusion and Telecommunications Studies] outside Rennes, but has otherwise not undertaken very much in fiberoptic communication. Its activity is otherwise rather like that of the previously mentioned companies.

In cooperation with Velec CGCT is also a candidate for delivery of the first phase local network in Plan Cable.

Velec (Address: 278, chaussee F Forest, B.P. 6303, 59203 Tourcoing. Telephone: 20/94 92 77. Telex: Velsefa 133 440.) Personnel 450, stock capital 11 million francs, turnover 107 million francs in 1982.

Velec is a private company, specializing in equipment for television reception and transmission. It is also about to begin mass production of equipment for satellite communication. In the fiberoptics area, the company produces transmission equipment for video signals.

Velec is participating in the CARTHAGE project in cooperation with CGCT. These two companies have also together submitted a proposal for equipment to "Plan Cable."

4.2 Terminal Point Components

Thomson-CSF, Division Composants Microondes (Address: 101, boulevard Murat, 75781 Paris Cedex 16. Telephone: 1/743 96 40. Telex: TCSF 204 780 F.) Turnover for the component division 3,400 million francs in 1982.

In its catalog Thomson-CSF has a quite complete offering of transmission and reception components. Its research laboratory in Orsay has announced a new type of laser diode with 5 mW power and only 35 mA threshold current. Wavelength 850 nm.

RTC = La Radiotechnique-Compelec (Address: 51, rue Carnot, B.P. 301, 92156 Suresnes Cedex. Telephone: 1/772 51 00. Telex: Radteco Suren 620 063 F.) Stock capital 300 million francs.

Philips subsidiary RTC manufactures among other things laser diodes for wavelengths from 780 to 860 nm and avalanche photo diodes. An 830-nm laser diode with built-in PIN diode for control use was recently presented.

CIT-Alcatel, Division Composants (Address: Centre de Villarceaux Nozay, 91620 La Ville du Bois. Telephone: 6/449 20 00. Telex: 692 412.)

CIT-Alcatel manufactures integrated so-called optical transmission heads both for multi-mode and single-mode fibers. These use laser diodes for 2,300 nm light wavelengths with a typical threshold current value of 150 mA. For reception there is an avalanche photo diode for 25 V bias.

4.3 Optical Fibers

FOI = Fibres Optiques Industries (Main office: 11, rues du Clos d'en Haut, 78702 Conflans-St-Honorine Cedex. Telephone: 3/972 65 36. Sales office: Route d'Etampes, 45300 Pithiviers. Telephone: 38/30 20 31. Telex: 780 377 F.) Stock capital 33 million francs. Employees: 80 persons.

FOI is a joint subsidiary of Quarts et Silice (Saint Gobain), LTT (Thomson-CSF) and Corning Glass Works. Production is optical fibers, partly according to the CVD method, but also with the use of a plasma gun. The application area is tele-, video- and data communications systems, as well as medical applications, meaning most things except underwater cable. FOI has delivered fibers to most projects described earlier in this report. Production capacity is said to be 30,000 km of fiber annually.

CLTO = Compagnie Lyonnaise de Transmission Optiques [Optical Transmission company of Lyon] (Address: 325, rue Jean Jaures, 95870 Bezons. Telephone: 1/410 57 57 Telex: 697 063 F.)

CLTO is a subsidiary of Les Cables de Lyon, which is part of the CGE group. Corning Glass Works, whose method is used, is part of CLTO as well. CLTO specializes in single mode fibers for underwater cable and has delivered cable for the previously described tests outside Antibes. It has also, together with CIT-Alcatel, been a candidate for delivery of the next (fiberoptic) Atlantic cable.

4.4 Fiberoptic Cable

Les Cables de Lyon [Lyon Cables] (Address: 170, avenue Jean Jaures, 69353 Lyon Cedex 2. Tel: 7/869 81 08. Tlx: 340 009 F.)

The company manufactures cable from CLTO's fibers, that is to say primarily intended for underwater use.

Cabeltel (Address: 50, rue J P Timbaud, B.P. 301, 92402 Courbevoie. Tel: 1/788 5060. Tlx: TCSF 204780 F.)
Cabeltel is a subsidiary of Thomson-CSF. It manufactures cable with fibers from FOI.

LTT (Address see above.) Subsidiary of Thomson, manufactures cable with fibers from FOI, of which it is part owner.

4.5 Connection Devices

Most major manufacturers of connection devices present various types of connectors for fiberoptics.

Socapex, 10 bis, quai Leon-Blum, B.P. 32, 92151 Suresnes Cedex. Tel: 1/772 91 13. Tlx: 204 780 F.

Socapex belongs to Thomson-CSF. Its series 725 is used in the Biarritz project.

Souriau & Cie, 13 rue du Gal. Gallieni, 92103 Boulogne-Billancourt. Tel: 1/609 92 00. Tlx: 250 918.

Radiall, 101, rue Philibert Hoffman, 93116 Rosny sous Bois Cedex. Tel: 1/854 80 40. Tlx: 220 673.

System Optoball and a new type of single mode fibers under development.

4.6 Measurements of Fiberoptics

FORT, address: 16, rue Bertin Poiree, 75001 Paris. Tel: 1/233 61 37. Tlx: 240 316 F.

FORT is a smaller company which since the 1970's has been working with fiberoptics, in particular for industrial uses. Among its products it has various instruments for measurements of fiberoptics.

Enertec-Schlumberger, 12, Place des Etats-Unis, B.P. 620, 92542 Montrouge. Tel: 1/657 11 23. Tlx: 204 376.

On license from CNET (see next chapter) Enertec makes miscellaneous measuring equipment for fiberoptics.

Hay Electronique, Mercure C, Zone industrielle d'Aix-en-Provence, 13763 Les Milles Cedex. Tel: 42/60 01 73.

Manufactures an optical reflectometer (HA 2020). Measurements can be made on 5 km fiber with a damping of 5 dB/km. Hay also makes welding equipment for optical fibers.

A.T.N.E., avenue de l'Atlantique, Z.I. de Courtaboeuf, B.P. 78, 91403 Orsay Cedex. Tel: 928 76 72.

Manufactures a system for measurement of transmission characteristics, fault detection and measurement of fiber length.

All of the four companies above can be described as "small or middle-sized."

In addition, Thomson-CSF's central laboratory has developed equipment for describing gradient index fibers by selectively transmitting light with various modes. Adress: Thomson-CSF, Laboratoire Centrale de Recherches, Domain de Corbeville, B.P. 10, 91401 Orsay. Tel: 6/019 70 00. Tlx: TCSF 204 780 F.

Similarly, CGE's research laboratory in Marcoussis has a test bench for measuring chromatic dispersion in the wavelength range 1.2 to 1.6 µm. Address: CGE-Laboratoire de Marcoussis, route de Nozay, 91460 Marcoussis. Tel: 6/449 10 00. Tlx: Labmarc 692 415 F.

This last-described equipment is primarily intended for internal use in each group of companies.

5 Application

A large part of the fiberoptics research in France is undertaken within the companies. An example is CGE's Laboratoire de Marcoussis and CLTO. They have succeeded in transmitting a video signal along a 90-km-long mode fiber. It is transmitted with a 1,300 nm laser diode signal and a total damping of 34 dB was achieved, which resulted in a signal/noise ratio of 53 dB at the receiver. The equipment was manufactured within the companies.

Other than that, the largest research institution is the Telecommunications Agency's CNET--Centre National d'Etudes des Telecommunications [National Center for Telecommunications Studies] with a total of more than 3,800 employees. Of these about half are located in the Paris region (Issy-les-Moulineaux and Bagneux) and half in Brittany (Lannion and Rennes). CENT also has a laboratory in Grenoble, where integrated circuits are manufactured.

CNET has been in existence since 1944-45. In 1974 the center introduced Corning's CVD method for manufacture of optical fibers in France. In 1982 a total of 38 contracts were signed with various industrial companies, which were to apply the results of CNET's research. As an example of this may be mentioned a tool for measuring effect on optical fibers. This was developed at CNET, and is being marketed by Chauvin-Arnoux (190, rue Championnet, 75018 Paris. Tel: 252 82 55. Tlx: 280 589.)

Specifically within fiberoptics CNET Bagneux has produced a 1,300-nm laser diode, and methods for manufacturing optical fibers have been developed.

The ongoing research focuses, for example, on the application of two wavelength windows in fibers in order to enable optical multiplexing and compression methods for video signals. In component technology work is being done with semiconductors constructed with substances from Groups III and V of the periodic table. Usual combinations are GaAs, GaP, InP and GaSb. One goal is to produce integrated optical circuits from such alloys. Address: CNET, rue du Gal-Leclerc, 92193 Issy-les-Moulineaux. Tel: 1/638 44 44.

In cooperation with TDF, CNET operates the research center CCETT--Centre Commun d'Etudes de Telediffusion et Telecommunications [Joint Center for Telediffusion and Telecommunications Studies] in Cesson-Sevigne outside Rennes. There, as was previously mentioned, a local network, CARTHAGE, is being studied for both internal and external telephone, data and video communications. The labor force is about 400 persons, most of whom work with image processing. Address: CCETT, rue du CLos Courtel, BP.P. 59, 35510 Cesson-Sevigne. Tel: 99/02 41 11.

CNRS = Centre National de la Recherche Scientifique [National Center for Scientific Research] has had optoelectronics on its research program for 2 years. Six projects are under way:

--Frequency modulation with optical KERR effect of mono-modal laser pulses.

--Characterization of different doped barium titanates for phase shifting applications.

--The effect of anomalies on conduction properties in multimodal fibers.

--New, organic, solid materials with non-linear optical properties.

--Phase-shifting in critical micelle systems with large non-linearities.

--Organic electroluminescence.

In addition there is a large number of projects in which CENT and CNRS cooperate. Address: 15, quai Anatole-France, 75700 Paris. Tel: 1/555 92 25.

ENST = Ecole Nationale Superieure des Telecommunications [National Institute of Telecommunications] is very closely tied to CNET. A certain amount of research is also carried out in connection with the teaching. Such a project concerns "Heterodyne Photodetection of Light Waves in Unimodal Fibers." Address: 46, rue Barrault, 75013 Paris. Telephone: 1/589 66 66.

LETI = Laboratoire d'Electronique et de Technologie de l'Informatique [Laboratory for Electronics and Information Technology] also works with fiberoptics. The purpose of this is mostly for integrated optical circuits. Some projects are being conducted in cooperation with CNET. LETI was formed in 1967 by CEA - Commissariat a l'Energie Atomique [Atomic Energy Commissariat] and is located in Grenoble. Address: LETI, 85 X, 38041 Grenoble CEDEX. Telephone: 76/97 41 11.

6 International Overview

Fiberoptics attracts great interest in most major industrial nations. In Japan and the United States there are fiberoptic long distance networks for telephone connections, from north to south in Japan and in the so-called northeast and southwest corridors in the United States. Japan has a very advanced optical component technology, and in the United States prices for optical fiber cables are being forced down due to a large number of manufacturers. In Canada there is a project aimed at installing local broadband networks.

In Great Britain work has been done with fiberoptic interurban networks and fiberoptic underwater cable.

The FRG is conducting a test project called "BIGFON," the objective of which is to install optical broadband networks in a number of cities with a maximum of 500 subscribers. Furthermore, there are urban telephone networks in which fiberoptics is used.

Italy is also carrying out experiments with fiberoptics in the telephone network.

Dutch Philips manufactures both fiberoptic cables and components.

Sweden does not exactly lag behind in this list. In Stockholm, Goteborg and Malmo telephone lines have already been drawn in fiberoptics. It is important to note that these are not experimental but were installed for purely economic reasons. The advantages of fiberoptics with greater bandwidth and longer transmission distance without repeaters were considered predominant. In addition to these, some pilot projects are being conducted, with transmission on single mode fiber, among others.

In the Skarpnack cable television network fiberoptics is to be used between the main station and substation. The hookups to the subscribers will be laid with coaxial cable.

Sieverts Cableworks does its own manufacturing of fibers for the fiberoptical cables.

So it is "not only France" which is interested in fiberoptic communication. The situation is approximately the same in several industrial nations. What is specific for France is above all the ambitious "Plan Cable," the ultimate goal of which is a fiberoptical broadband network covering the whole nation.

If these plans are followed at the same time as installation of fiberoptics in the telephone network, the French telecommunications industry will have both job opportunities and occasion to develop its knowledge and in that manner be well prepared for the "clearly leading" role which fiberoptics is likely to play in the communications system of the future.

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11949
CSO: 5500/2646

BRIEFS

MEXANDEAU ON 'EUROPEAN' TELECOMMUNICATIONS--Strasbourg. Mr. Louis Mexandeau, the PTT Minister, launched an appeal on 27 March to the European Parliament for the creation of a "European telecommunications space." "There has been a North-American space for long time, and it could be that a world space would swallow up every country in Europe, taken individually, if nothing is done to stop it," he declared. The European cooperation movement in certain sectors partitioned by national monopolies has "hardly started, and is still uncertain," emphasized the Minister. "It must be enlarged with all the information technologies, and a European telephone switching, videotex, data processing, and components industry must be created to withstand the Japanese and American giants." "We must set up joint standards and unify equipment authorization conditions," he added. Stressing the need to establish fiber-optic links between the European capitals, Mr. Mexandeau cited the ambitious Franco-German project for a joint cell radio telephone system which should be firmed up within the next few months and lay the foundations for a true European space for the radio telephone, used mainly in automobiles. The PTT minister was visiting Strasbourg on the occasion of a stamp issue amounting to 12 millions, "intended to sensitize the peoples of old Europe" to what is at stake in the forthcoming European elections. Each of "The Ten" is issuing a national stamp for these elections. [Text] [Paris AFP SCIENCES in French 29 Mar 84 p 37] 12434

CANADA OFFERS SATELLITE CHANNEL--Paris. Canada has offered France the use of a channel on one of its telecommunications satellites to broadcast television programs to the Saint-Pierre et Miquelon islands. These could also be picked up on the North American continent. In Paris for a working visit of four days, the Canadian Communications Minister, Mr Francis Fox, told the press on 23 February that he had made this proposal in the course of conversations with his French counterpart, Mr Louis Mexandeau, the PTT Minister, and with the minister of culture, Mr Jack Lang (who are to travel to Canada in May and June, respectively) and with various high officials of the Elysee Palace and the Quai d'Orsay. The Canadian minister recalled on this occasion that Mr Mexandeau had, in September 1983, asked for Canada's support for a French application for a channel on a geostationary satellite to serve Saint-Pierre et Miquelon. Since this application could not be granted for about ten years, he said, Ottawa offered Paris a channel on a Canadian satellite. [Text] [Paris AFP SCIENCES in French 1 Mar 84 p 33] 12434

SOUTH KOREAN SATELLITE INTEREST--Paris. A delegation from the Korea Industrial Development Institute (South Korea) recently visited the MATRA Centre d'integration de satellites (Satellite Integration Center) in Toulouse, where he was received by Mr. Jean-Luc Lagardere, the French company's CEO. This visit, a MATRA release says, was part of the preparation for an international bid for a Korean satellite communications system which, although no definite decision had been made, could be launched for the 1988 Olympic Games. [Text] [Paris AFP SCIENCES in French 1 Mar 84 p 34] 12434

CSO: 5500/2659

NATIONWIDE COMPUTER NETWORK TO BE IN FULL USE IN 1985

Reykjavik MORGUNBLADID in Icelandic 29 Mar 84 p 14

[Article: "Computer Network Put in Use on Trial Bases in Approximately 1 Year: In Full Use Middle of Next Year"]

> [Text] New equipment for a general computer network that will open up new ways in domestic and foreign communications is expected to arrive in the country around the turn of the year. The computer network will be put in full use around the middle of next year.
>
> According to Chief Engineer Thorvardur Jonsson of the Post and Telegraph Administration the computer network will be useful for people in many ways. It will cover the whole country and connect computers and computer terminals. This network will provide a data transfer channel from, for example, a company's mainframe computer to the company's remote computers and display screens that are needed to access data from the mainframe computer.

Abroad there are, for example, medicine and engineering data banks which users here will be able to access easily and cheaply through the computer networks.

A new service called Teletex, which in many ways resembles Telex but has 48 times greater speed, uses the general computer network to communicate. Later there will be connector equipment between the computer network and the telex network so that the users of Teletex and Telex will be able to communicate.

A potential addition to the general computer network is a so-called electronic mail box service for the public.

This service makes it possible to transmit messages to the consumer's electronic mail box. When the consumer calls his mail box, he receives the message on his screen and can respond; he is also able to transmit his own message to others through his own mail box.

Inexpensively, consumers can gain access to the computer network by logging on to it through the automatic telephone system.

According to Thorvardur Jonsson the computer network will be ordered from L.M. Ericsson in Sweden and it is expected that it will completely pay for itself and will not be a financial burden to other post and telephone services.

Jonsson said that there was an enormous difference between the lowest and the highest bid for the computer network equipment and the lowest of seven bids was accepted.

9583
CSO: 5500/2654

TALKS HELD WITH NORWEGIANS ON GETTING PROGRAMS VIA TELE-X

Reykjavik MORGUNBLADID in Icelandic 3 Apr 84 p 27

[Article: "Proposals to the Nordic Council of Ministers: Television Broadcasts between the Nordic Countries via Tele-X Satellite"]

[Text] Icelandic Television Material via Norwegian-Icelandic Channel

On behalf of the Nordic Council of Ministers, a working group has proposed that the Nordic countries rent three channels of the Tele-X satellite for television broadcasts between the Nordic countries. The satellite will be launched in February 1987 with an Ariane Euromissile.

One channel will be Swedish, another Finnish and the third Norwegian-Icelandic. Most likely Tele-X transmissions will not reach Iceland, not in the beginning at any rate, but it is, however, considered possible to transmit television broadcasts to Iceland with an ECS-telecommunications satellite or Intelsat. Intelsat transmissions would cost 30 million Swedish kroner a year based on 35 viewing hours a week but conceivably 18 million Swedish kroner if it is possible to use available ECS space.

This came forth at a conference on television affairs in the Nordic countries that was held in Stockholm last weekend. As reported by the MORGUNBLADID, the Norwegians have rented a channel on the ECS-2 telecommunications satellite and plan to use it to televise to Svalbard and offshore oil platforms off the coast of Norway. Transmissions via this television channel would reach Iceland and there have been ideas about starting Norwegian television transmissions to Iceland.

According to a report from the working group, the Icelandic material that would be transmitted from Iceland to the other Nordic countries via Tele-X would be mainly news but also music programs. Because of the time difference, it is considered natural to tape the news from the Icelandic television and transmit it later that evening. It is presumed that the Icelandic material will be translated to a considerable extent to the other Nordic languages. As the Norwegians only have one television channel, the possibilities are considered quite good to put the Icelandic material on that channel as the programming time of the Icelandic television is so short. On account of the

time difference there has also been talk about transmitting the Icelandic television material on the Finnish channel.

Because of cost it is considered feasible to send other Icelandic material than news to the television station by air. In the report from the working group there is a draft for a program for these new television channels, including the Norwegian-Icelandic channel, and the Icelandic material is mainly news as mentioned before.

The Tele-X satellite also has radio channels and it is especially pointed out in the report that it would be practical for Icelanders living in the other Nordic countries to receive broadcasts from the Icelandic radio on those channels.

It came forth during discussions at the conference that the Danes have the opportunity to receive both Swedish and West German television stations. But studies have shown that a very small portion of the television viewers make us of these possibilities. In Norway there are some possibilities of receiving transmissions from a British television station called "Sky Channel" which televises via satellite and is partially owned by the Australian newspaper mogul Rupert Murdoch. A Norwegian speaker said that there was very little interest in these transmissions among Norwegian television viewers but all the more among Norwegian newspapers.

Minister of Education Ragnhildur Helgadottir opened the conference on Sunday and said, among other things, that the participation of Iceland in the television cooperation of the Nordic countries was based on cultural and political grounds and a desire to increase the variety of television material in Iceland. She mentioned a proposal for new radio laws currently before the Althing which aim at abolishing the monopoly of the state radio broadcasting. The minister of education said that progress in technology has made such a monopoly obselete.

Television Managing Director Petur Gudfinnsson gave a speech at the conference and gave a thorough summary of the situation in these matters in Iceland.

Member of Parliament Eidur Gudnason participated in a panel discussion and said that a cultural battle would rage in Europe in the coming years which would be fought with satellites. The Nordic countries must contribute their share in this battle against cultural influences from other larger nations.

9583
CSO: 5500/2654

LABOR PARTY ORGAN ARGUES CASE FOR KEEPING MONOPOLY INTACT

Oslo ARBEIDERBLADET in Norwegian 2 Apr 84 p 4

[Editorial: "Televerket"]

[Text] Even the bitterest opponent of government management [illegible] Televerket [Government office for telephone, telegraph, radio and broadcasting] has gotten its organization into good shape. That [illegible] department is able to show very good operating results today, and [illegible] because it is operating with a surplus amounting to billions [illegible] can also be pointed out that telephone queues [illegible] just a memory. There are many reasons for the [illegible] began to understand a few years that they had to give Televerket better economic circumstances in which to operate if it was going to solve this country's biggest communications problem, the telephone queues. Furthermore, the department's management was able to inspire its 20,000 employees [illegible] harder. The entire organization has undergone a face lifting. Televerket stands out as a professional organization today.

But with the elimination of the telephone queues Televerket is faced with new problems, although they perhaps can be said to be unique [illegible] part of the apparatus has been targeted on the task of getting rid of the queues over the years. Thousands of people have been employed in this work. Now manpower is being released that is ready to meet new challenges. As a government department, Televerket has an obligation to guarantee that its employees will continue to have jobs.

Parallel with the manpower problem, we perceive the development of our new technological society, in which telecommunications and data-processing technologies are in the process of merging into one process. A telephone is no longer just a telephone, and a data-processing machine is no longer independent of the telephone network. In the new information-oriented society, we will have full integration of various services and we will perform all telecommunications and data-processing services from a single terminal. As the new technology develops, the traditional boundaries between the areas handled by Televerket and the private data-processing companies [illegible] will be obliterated.

In this process, Televerket must engage heavily in competition with private business as a matter of course. The department must have a sufficient [illegible]

rein with respect to the political authorities. It is not true that Televerket is trying to extend its monopoly. What the department's management is asking for is to be able to participate on equal terms in a number of areas in which it is natural for a modern telecommunications enterprise to be active, even though they are areas that are dominated by private business at present.

Next spring, according to schedule, the Storting will make an announcement concerning Televerket's future position in communications developments. An announcement from the government is expected late in the fall.

In expectation of these announcements, the government has frozen Televerket's activities. In spite of all the favorable developments, that department is in a difficult phase of its existence because it is extremely uncertain as to what its future will be. The amount of development taking place in telecommunications is enormous. The big international giants, headed by IBM, are in the process of gaining larger and larger shares of the market where providing terminal equipment that can be connected with the telephone network in Norway is concerned. At present, Televerket's ability to compete in that market is sharply restricted. The government will not permit any expansion before the final political clarifications have been made.

During that time, the data-processing giants will have obtained even stronger footholds in the market. In our opinion, it is an absure situation for Televerket, which has an enormous apparatus at its disposal, not to be able to compete on equal terms. The responsible authorities should demonstrate greater respoasibility here.

9266
CSO: 5500/2658

BRIEFS

DIGITAL EXCHANGE CONTRACT--EB Scanword has entered into a framework agreement with Televerket, the Norwegian telecommunications department, on the delivery of interoffice telephone exchanges valued at some 60 million kroner over a two-year period. Televerket simultaneously secured options for additional deliveries. The agreement is concerned with the MD 110 telephone exchange system, which was introduced into the Norwegian telephone network at the beginning of 1984. The new interoffice exchange consists of an internal communications system for enterprises with a need for 100 or more telephones, and up to as many as 1,000. The system has built-in services such as abbreviated dialing, internal processing of busy-signal and unanswered calls, coupled with repetition of the last number dialed, other exchanges or systems, etc. [Text] [Oslo AFTENPOSTEN in Norwegian 30 Mar 84 p 27] 9266

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